S8238

Version 1.1

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Before you begin…

Check the box contents!

The retail motherboard package should contain the following:

	1x S8238 Motherboard
	1 x S8238 User's manual
	1 x S8238 Quick reference guide
	1 x TYAN® Driver CD

Chapter 1: Instruction

1.1 Congratulations

You have purchased the powerful TYAN® S8238 motherboard, based on the AMD® SR5650 (S8238GM2NR-LE) / SR5670 (S8238GM2NRI) & SP5100 chipsets. The S8238 is designed to support dual AMD® 32nm 16-Core/12-Core/8-Core/4-Core Opteron 6200 Series Processors and up to 192GB of 800/1066/1333/1600MHz DDR3 memory modules. Leveraging advanced technology from AMD®, the S8238 is capable of offering scalable 32 and 64-bit computing, high-bandwidth memory design, and lightning-fast PCI-E bus implementation.

The S8238 not only empowers you in today's demanding IT environment but also offers a smooth path for future application upgradeability. All of these rich feature sets provides the S8238 with the power and flexibility to meet demanding requirements for today's IT environments.

Remember to visit the TYAN® website at **http://www.tyan.com**. There you can find all the information on all TYAN® products as well as all the supporting documentation, FAQs, Drivers and BIOS upgrades.

1.2 Hardware Specifications

TYAN S8238 (S8238GM2NR-LE)

Processor	**Supported CPU Series**	AMD 32nm 16-Core/12-Core/8-Core/4-Core Opteron 6200 Series Processors (Interlagos) / (2) HT3; 16MB L3 per socket
	Features	HyperTransport™3 technology (HT3) links provide up to 102.4 GB/s peak bandwidth per processor; Quad 16-bit HyperTransport™3 technology (HT3) links provide up to 6.4GT/s per link.
	Socket Type / Q'ty	G34 / (2)
	Average CPU Power (ACP) wattage	Up to 105W
	System Bus	Up to 6.4 GT/s Hyper-Transport link support
Chipset	**Chipset**	AMD SR5650 + SP5100
Memory	**Supported DIMM Qty**	(8)+(4) DIMM slots
	DIMM Type / Speed	U/RDDR3 & LV RDDR3, 800/1066/1333/1600 MHz
	Capacity	Up to 192GB
	Memory channel	4 Channels per CPU
	Memory voltage	1.5V or 1.35V

Expansion Slots	**PCI-E**		(1) PCI-E Gen.2 x16 slot
	Recommended TYAN Riser Card		M7018-R16-1L, 1U PCI-E x16 riser card (right)
Recommended Barebones / Chassis	**1U Barebones**		YR190-B8238-X2
LAN	**Port Q'ty**		(2)
	Controller		Intel 82574L
Storage	**SATA**	**Connector**	(1) Mini-SAS
		Controller	AMD SP5100
		Speed	3.0 Gb/s
		RAID	RAID 0/1/10/5 (Promise Integrated Software RAID)
Graphic	**Connector type**		D-Sub 15-pin
	Resolution		1600x1200@60Hz
	Chipset		Aspeed AST2050
Input /Output	**USB**		(4) USB 2.0 ports (2 at rear, 2 via cable)
	COM		(1) port
	VGA		(1) D-Sub 15-pin VGA port
	RJ-45		Total (2) GbE ports, (1) shared with IPMI
	Power		Proprietary 20-pin (12V single input) power connector
	Front Panel		(1) 2x12-pin SSI front panel header
	SATA		(1) Mini-SAS connector for (4) SATA II
System Monitoring	**Chipset**		Winbond W83795G
	Voltage		Monitors voltage for CPU, memory, chipset & power supply
	Fan		Total (3) 8-pin headers
	Temperature		Monitors temperature for CPU & system environment
	LED		Fan fail LED indicator / Over temperature warning indicator / Fan & PSU fail LED indicator
	Others		Chassis intrusion detection / Watchdog timer support
Server Management	**Onboard Chipset**		Onboard Aspeed AST2050
	AST2050 IPMI Feature		IPMI 2.0 compliant baseboard management controller (BMC) / USB 2.0 virtual hub / BIOS update
	AST2050 iKVM Feature		24-bit high quality video compression / Dual 10/100 Mb/s MAC interfaces
BIOS	**Brand / ROM size**		AMI / 4MB
	Feature		Plug and Play (PnP) /PCI2.3 /WfM2.0 /SMBIOS2.3 /PXE boot / ACPI 2.0 power management /Power on mode after power recovery / User-configurable H/W monitoring

Physical Dimension	Form Factor	Proprietary
	Board Dimension	6.3"x18" (160.02x457.2mm)
Operating System	OS supported list	Please visit our Web site for the latest update.
Regulation	FCC (DoC)	Class A
	CE (DoC)	Yes
Operating Environment	Operating Temp.	10° C ~ 35° C (50° F~ 95° F)
	Non-operating Temp.	- 40° C ~ 70° C (-40° F ~ 158° F)
	In/Non-operating Humidity	90%, non-condensing at 35° C
RoHS	RoHS 6/6 Complaint	Yes
Package Contains	Motherboard	(1) S8238 Motherboard
	Manual	(1) User's manual / (1) Quick Ref. Guide
	Installation CD	(1) TYAN installation CD in bulk packing carton

TYAN S8238 (S8238GM2NRI)

Processor	Supported CPU Series	AMD 32nm 16-Core/12-Core/8-Core/4-Core Opteron 6200 Series Processors (Interlagos) / (2) HT3; 16MB L3 per socket
	Features	HyperTransport™3 technology (HT3) links provide up to 102.4 GB/s peak bandwidth per processor; Quad 16-bit HyperTransport™3 technology (HT3) links provide up to 6.4GT/s per link.
	Socket Type / Q'ty	G34 / (2)
	Average CPU Power (ACP) wattage	Up to 105W
	System Bus	Up to 6.4 GT/s Hyper-Transport link support
Chipset	Chipset	AMD SR5670 + SP5100
Memory	Supported DIMM Qty	(8)+(4) DIMM slots
	DIMM Type / Speed	U/RDDR3 & LV RDDR3, 800/1066/1333/1600 MHz
	Capacity	Up to 192GB
	Memory channel	4 Channels per CPU
	Memory voltage	1.5V or 1.35V
Expansion Slots	PCI-E	(1) PCI-E Gen.2 x16 slot
	Recommended TYAN Riser Card	M7018-R16-1L, 1U PCI-E x16 riser card (right)
Recommended Barebones / Chassis	1U Barebones	YR190-B8238-X2

LAN	**Port Q'ty**		(2)
	Controller		Intel 82574L
Storage	**SATA**	**Connector**	(1) Mini-SAS
		Controller	AMD SP5100
		Speed	3.0 Gb/s
		RAID	RAID 0/1/10/5 (Promise Integrated Software RAID)
Graphic	**Connector type**		D-Sub 15-pin
	Resolution		1600x1200@60Hz
	Chipset		Aspeed AST2050
Infiniband	**Port Q'ty / Speed**		(1) QSFP port / 40Gb/s
	Chipset		Mellanox ConnectX IB MT25408A0-FCCR-QIS
	Feature		QDR (Quad. Data Rate)
Input /Output	**USB**		(4) USB 2.0 ports (2 at rear, 2 via cable)
	COM		(1) port
	VGA		(1) D-Sub 15-pin VGA port
	RJ-45		Total (2) GbE ports, (1) shared with IPMI
	Power		Proprietary 20-pin (12V single input) power connector
	Front Panel		(1) 2x12-pin SSI front panel header
	SATA		(1) Mini-SAS connector for (4) SATA II
System Monitoring	**Chipset**		Winbond W83795G
	Voltage		Monitors voltage for CPU, memory, chipset & power supply
	Fan		Total (3) 8-pin headers
	Temperature		Monitors temperature for CPU & system environment
	LED		Fan fail LED indicator / Over temperature warning indicator / Fan & PSU fail LED indicator
	Others		Chassis intrusion detection / Watchdog timer support
Server Management	**Onboard Chipset**		Onboard Aspeed AST2050
	AST2050 IPMI Feature		IPMI 2.0 compliant baseboard management controller (BMC) / USB 2.0 virtual hub / BIOS update
	AST2050 iKVM Feature		24-bit high quality video compression / Dual 10/100 Mb/s MAC interfaces
BIOS	**Brand / ROM size**		AMI / 4MB
	Feature		Plug and Play (PnP) /PCI2.3 /WfM2.0 /SMBIOS2.3 /PXE boot / ACPI 2.0 power management /Power on mode after power recovery / User-configurable H/W monitoring
Physical Dimension	**Form Factor**		Proprietary
	Board Dimension		6.3"x18" (160.02x457.2mm)
Operating System	**OS supported list**		Please visit our Web site for the latest update.

Regulation	**FCC (DoC)**	Class A
	CE (DoC)	Yes
Operating Environment	**Operating Temp.**	10° C ~ 35° C (50° F~ 95° F)
	Non-operating Temp.	- 40° C ~ 70° C (-40° F ~ 158° F)
	In/Non-operating Humidity	90%, non-condensing at 35° C
RoHS	**RoHS 6/6 Complaint**	Yes
Package Contains	**Motherboard**	(1) S8238 Motherboard
	Manual	(1) User's manual / (1) Quick Ref. Guide
	Installation CD	(1) TYAN installation CD in bulk packing carton

1.3 Software Specifications

For OS (operation system) support, please check with TYAN® support for latest information.

Remember to visit our Web site at http://www.tyan.com for the latest AST2050 User's Guide.

NOTE

Chapter 2: Board Installation

You are now ready to install your motherboard.

How to install our products right… the first time

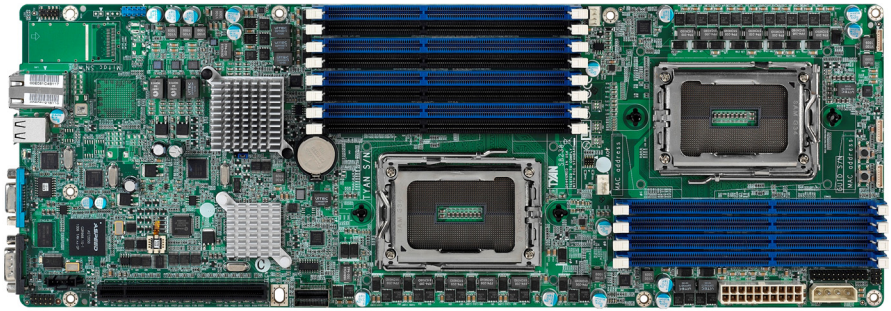
The first thing you should do is reading this user's manual. It contains important information that will make configuration and setup much easier. Here are some precautions you should take when installing your motherboard:

(1) Ground yourself properly before removing your motherboard from the antistatic bag. Unplug the power from your computer power supply and then touch a safely grounded object to release static charge (i.e. power supply case). For the safest conditions, MiTAC recommends wearing a static safety wrist strap.
(2) Hold the motherboard by its edges and do not touch the bottom of the board, or flex the board in any way.
(3) Avoid touching the motherboard components, IC chips, connectors, memory modules, and leads.
(4) Place the motherboard on a grounded antistatic surface or on the antistatic bag that the board was shipped in.
(5) Inspect the board for damage.

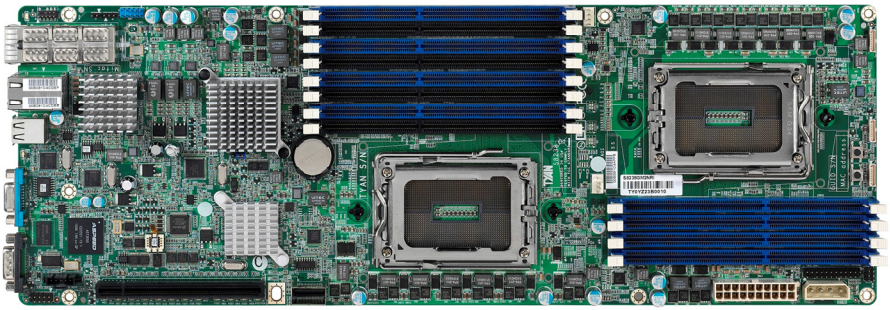
The following pages include details on how to install your motherboard into your chassis, as well as installing the processor, memory, disk drives and cables.

NOTE: Do not apply power to the board if it has been damaged.

2.1 Board Image



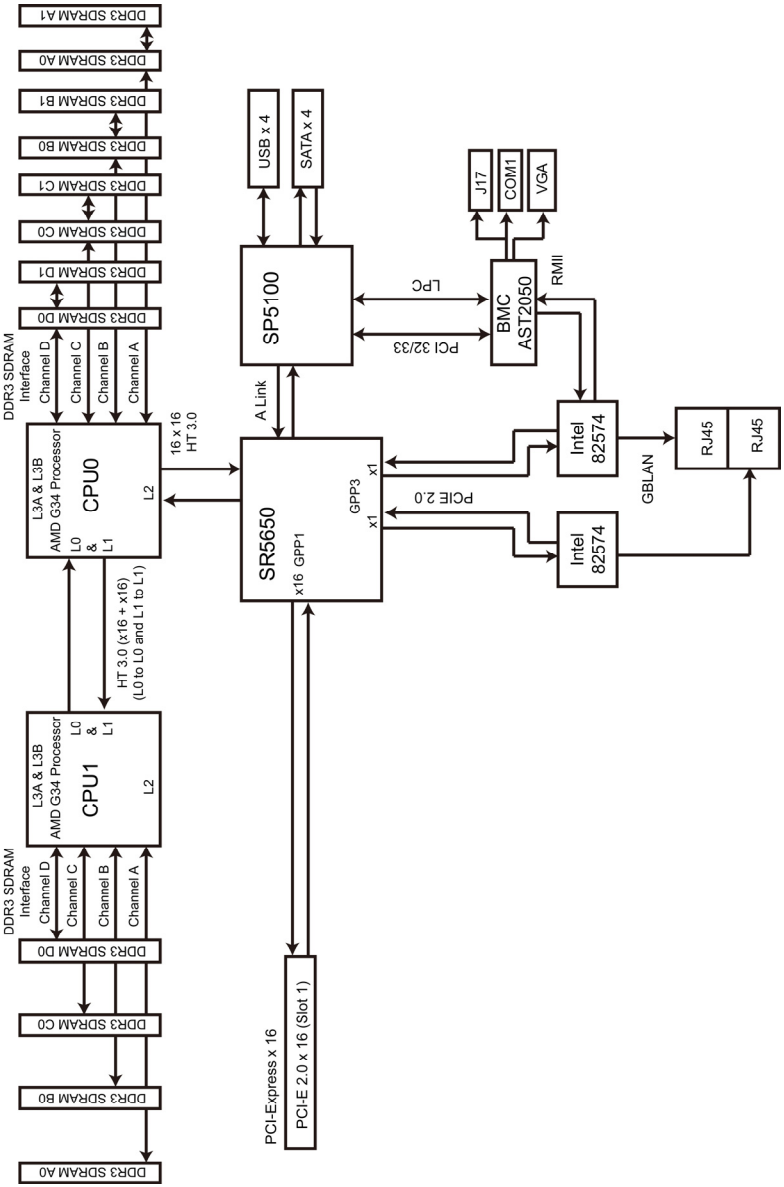
S8238GM2NR-LE



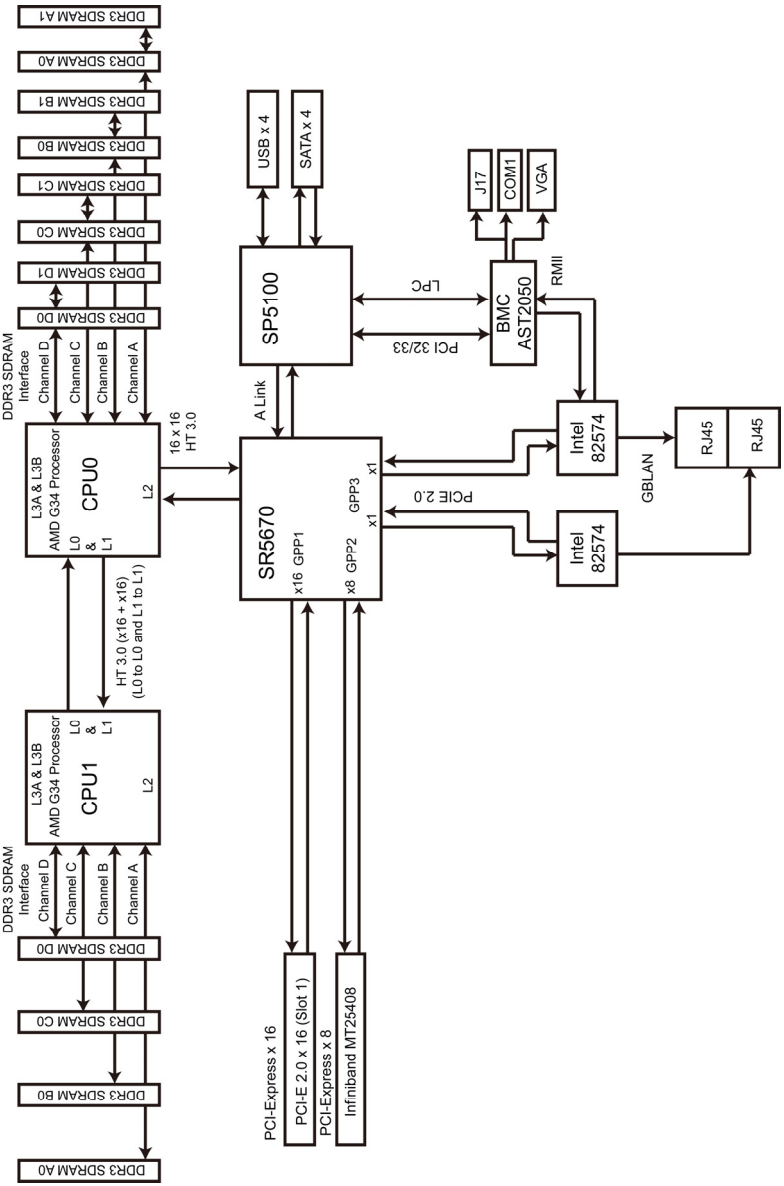
S8238GM2NRI

This picture is representative of the latest board revision available at the time of publishing. The board you receive may not look exactly like the above picture.

2.2 Block Diagram

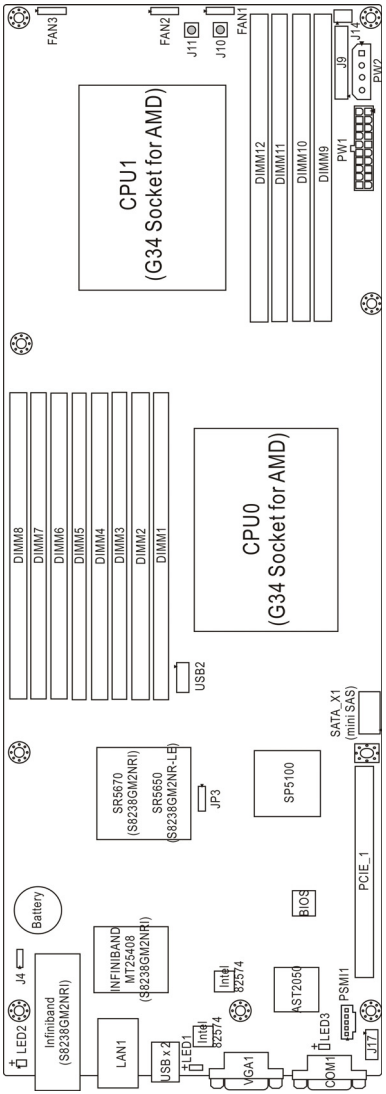


S8238GM2NR-LE Block Diagram



S8238GM2NRI Block Diagram

2.3 Board Parts, Jumpers and Connectors



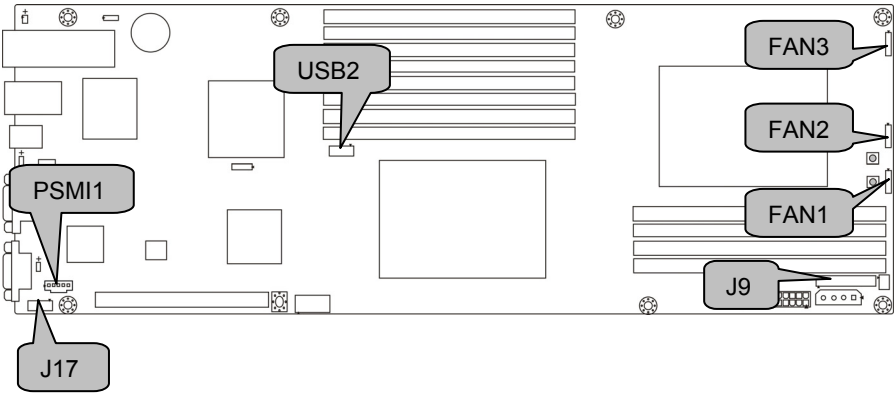
This diagram is representative of the latest board revision available at the time of publishing. The board you receive may not look exactly like the above diagram. But for the DIMM number please refer to the above placement for memory installation. For the latest board revision, please visit our web site at http://www.tyan.com.

Jumpers & Connectors

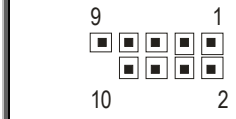
Jumper/Connector	Function
J4	Infiniband SMB Header
J9	Front Panel Header
J10	Reset Button
J11	Power Button
J14	BMC SMB Header
J17	COM Port Header (share with COM1)
FAN1/FAN2/FAN3	8-pin 4056 Fan Header (for Barebone)
PSMI1	PSMI Connector
USB2	USB Front Panel Header
JP3	Clear CMOS Jumper
LED1	ID LED
LED2	Infiniband LED
LED3	Standby Power LED

Jumper Legend

	OPEN - Jumper OFF	Without jumper cover
	CLOSED - Jumper ON	With jumper cover


FAN3
USB2
FAN2
PSMI1
FAN1
J9
J17

J17: COM Port Header (share with COM1)



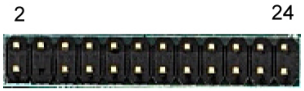
Signal	Pin	Pin	Signal
DCD1	1	2	DSR1
RXD1	3	4	RTS1
TXD1	5	6	CTS1
DTR1	7	8	RI1
GND	9	10	KEY PIN

FAN1/FAN2/FAN3: 8-pin 4056 Fan Header (Barebones use only)

Signal	Pin	Pin	Signal
PWM1	1	2	+12V
TACH1	3	4	GND
GND	5	6	TACH2
+12V	7	8	PWM2

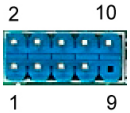
NOTE: Do not mix 8-pin Fan headers with 4-pin Fan headers. Mixing these fan headers will cause problems to the system.

J9: Front Panel Connector



Signal	Pin	Pin	Signal
PW_LED+	1	2	FP_PWR
KEY PIN	3	4	ID_LED+
PWR_LED-	5	6	ID_LED-
HDD_LED+	7	8	FAULT_LED1-
HDD_LED-	9	10	FAULT_LED2-
PWR_SW#	11	12	LAN1 ACTLED+
GND1	13	14	LAN1 ACTLED-
RST_SW#	15	16	SMBUS SDA
GND2	17	18	SMBUS SCL
SYS_ID_SW	19	20	INTRUSION#
NC	21	22	LAN2 ACTLED+
NMI_SW#	23	24	LAN2 ACTLED-

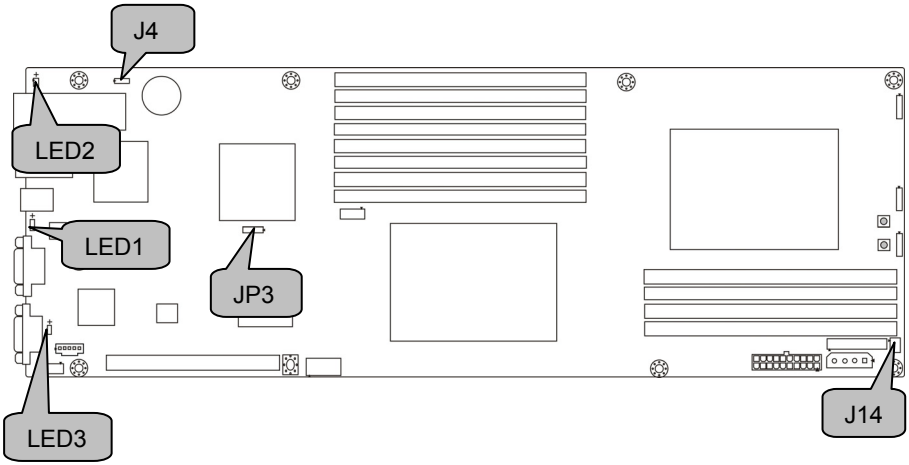
USB2: USB Front Panel Connector



Signal	Pin	Pin	Signal
V5AUX	1	2	V5AUX
USB2+	3	4	USB3+
USB2-	5	6	USB3-
GND	7	8	GND
KEY PIN	9	10	GND

PSMI1: PSMI Connector

Pin	1	2	3	4	5
Signal	PSU_SMB_SCL	PSU_SMB_SDA	NC	GND	VCC3



JP3: Clear CMOS Jumper

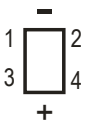
3 1 Normal (**Default**)	You can reset CMOS by using this jumper if you have forgotten your system/setup password or need to clear BIOS setting. 1. Power off system and disconnect both power connectors from the motherboard. 2. Use jumper cap to close Pin_2 and Pin_3 for seconds to Clear CMOS. 3. Put jumper cap back to Pin_1 and Pin_2 (default setting). 4. Reconnect power & power on system.
3 1 Clear CMOS	

LED1: ID LED

Pin	Signal	
+	P3V3_AUX	
-	ID_SW_L	
State	**Color**	**Description**
On	Blue	System identified
Off	Off	System not identified

NOTE: IPMI can activate ID LED from remote site.
Please visit the TYAN Web Site at **http://www.tyan.com** to download the latest AST2050 Software Configuration Guide for IPMI settings.

LED2:Infiniband LED



Pin	Signal	
+ 4	VCC3	
- 2	Infiniband Link-	
+ 3	VCC3	
- 1	Infiniband Active-	
State	**Color**	**Description**
Link	Green	Infiniband Link
Active	Orange	Infiniband Active
Off	Off	Infiniband no link

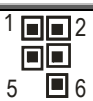
LED3: Standby power LED

Pin	Signal	
+	P3V3_AUX	
-	GND	
State	**Color**	**Description**
On	Blue	Standby Power OK
Off	Off	No power

J4: Infiniband SMB Header

Pin	Signal
1	Infiniband_SMB SCL
2	Infiniband_SMB SDA
3	GND

J14: BMC SMB Header



Signal	Pin	Pin	Signal
V3AUX	**1**	**2**	BMC_SMB_SCL
GND	**3**	**4**	BMC_SMB_SDA
KEY PIN	**5**	**6**	BMC_Error_LED

2.4 Installing the Processor and Heat sink

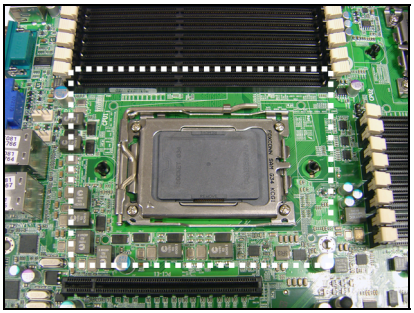
The S8238 supported AMD® processors are listed in section ***Hardware Specifications*** on page 4. Check our website at **http://www.tyan.com** for latest processor support.

> **NOTE:** MiTAC is not liable for damage as a result of operating an unsupported configuration.

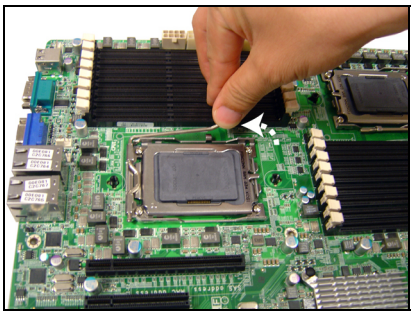
Processor Installation (G34 1944-pin Socket for AMD CPU)

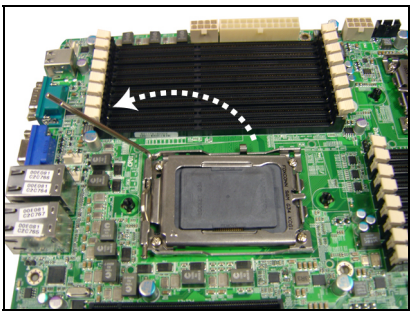
Follow the steps below to install the processors and heat sinks.
Please note that the illustrations are based on a G34 1944-pin Socket which may not look exactly like the motherboard you purchased. Therefore, the illustrations should be held for your reference only.
NOTE: If only one processor is installed, start with CPU0 first.

1. Locate the CPU socket.

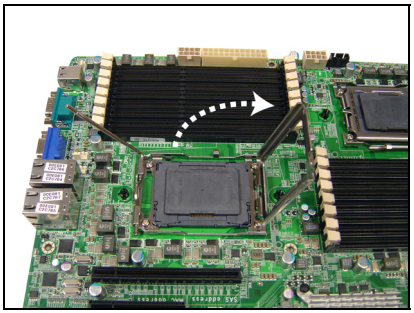


2. Pull the CPU lever slightly away from the socket and then push it to a fully open position.

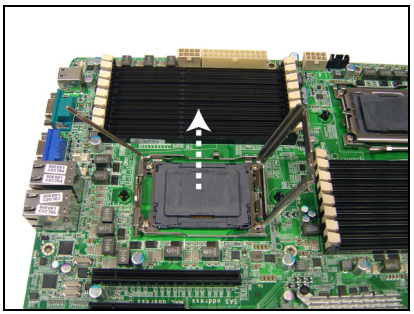


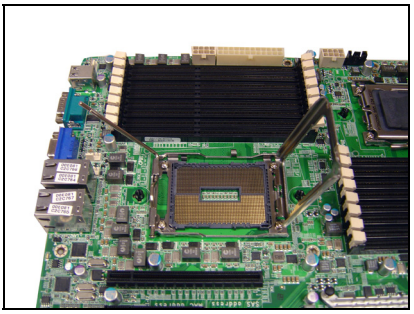


3. Lift the socket cover to a fully open position.

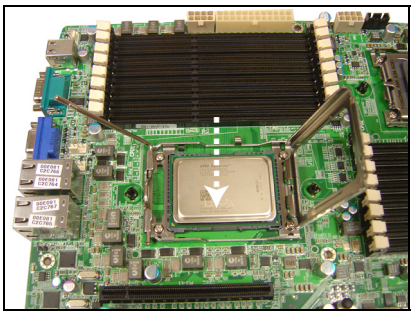


4. Take off the CPU protection cap.

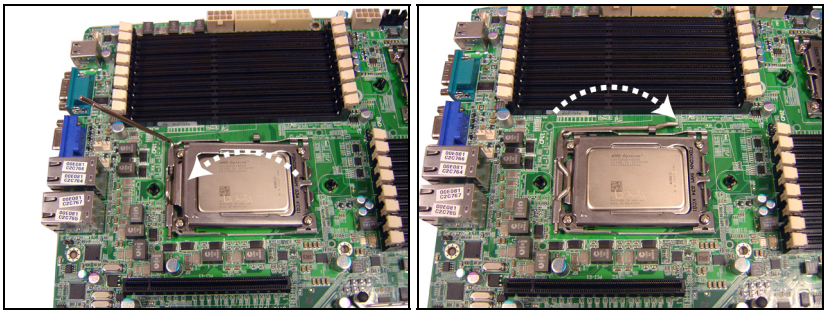




5. Place the CPU in the CPU socket and make sure that the gold arrow is located in the right direction with two notches properly aligned.



6. Close the socket cover and press the CPU socket lever down to lock the CPU in place.



7. Repeat the same procedures to install the second CPU.

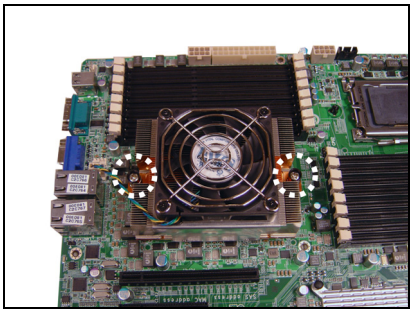
Heat sink Installation

After installing the processor, you should proceed to install the heat sink. The CPU heat sink will ensure that the processor do not overheat and continue to operate at maximum performance for as long as you own them. The overheated processor is dangerous to the motherboard.

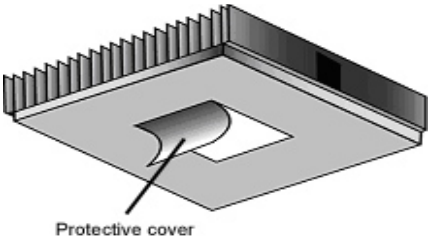
For the safest method of installation and information on choosing the appropriate heat sink, using heat sinks validated by AMD®. Please refer to the AMD® website: **http://www.amd.com**

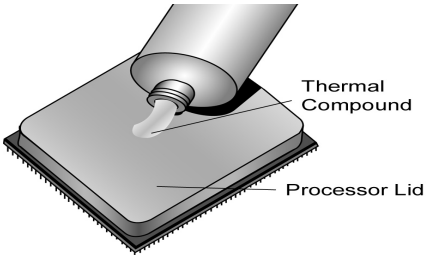
The following diagram illustrates how to install heat sink onto the CPU of S8238.

8. Place the heat sink on top of the CPU and secure it to the motherboard with 2 screws.



2.5 Thermal Interface Material





There are two types of thermal interface materials designed for use with the processors.

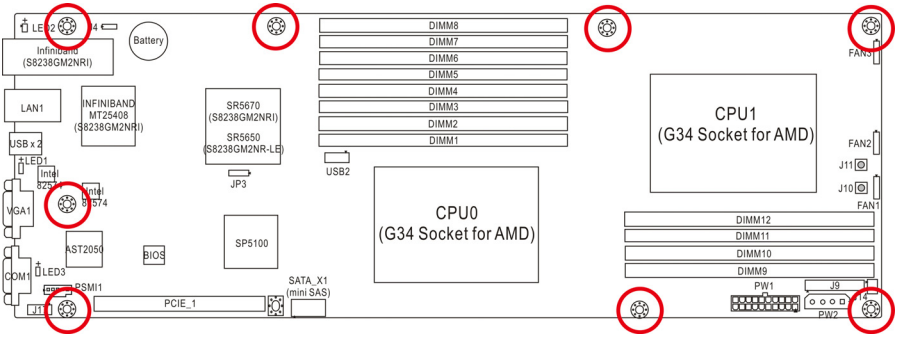
The most common material comes as a small pad attached to the heat sink at the time of purchase. There should be a protective cover over the material. Take care not to touch this material. Simply remove the protective cover and place the heat sink on the processor.

The second type of interface material is usually packaged separately. It is commonly referred to as 'thermal compound'. Simply apply a thin layer on to the CPU lid (applying too much will actually reduce the cooling).

NOTE: Always check with the manufacturer of the heat sink & processor to ensure that the thermal interface material is compatible with the processor and meets the manufacturer's warranty requirements.

2.6 Tips on Installing Motherboard in Chassis

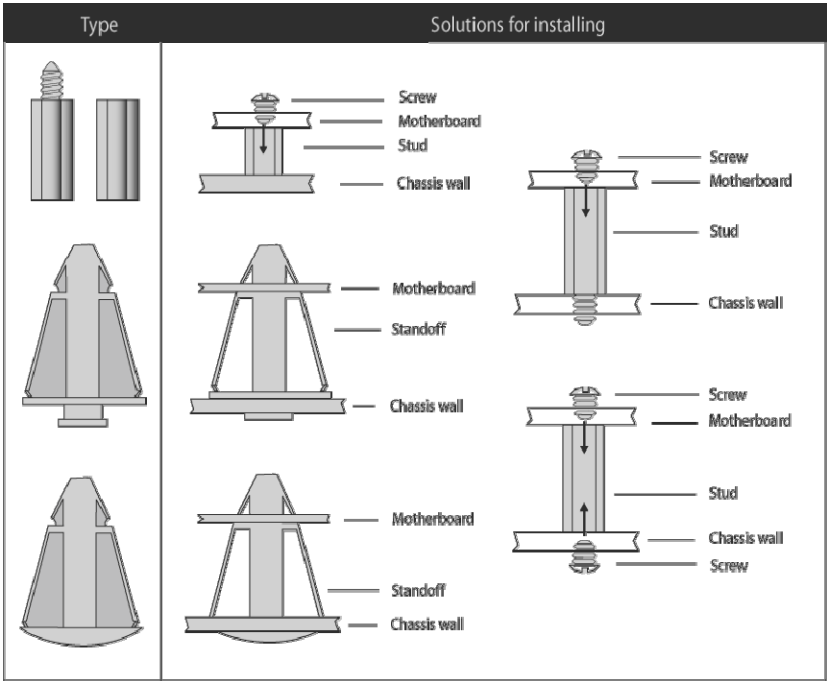
Before installing your motherboard, make sure your chassis has the necessary motherboard support studs installed. These studs are usually metal and are gold in color. Usually, the chassis manufacturer will pre-install the support studs. If you are unsure of stud placement, simply lay the motherboard inside the chassis and align the screw holes of the motherboard to the studs inside the case. If there are any studs missing, you will know right away since the motherboard will not be able to be securely installed.



Some chassis include plastic studs instead of metal. Although the plastic studs are usable, MiTAC recommends using metal studs with screws that will fasten the motherboard more securely in place.

Below is a chart detailing what the most common motherboard studs look like and how they should be installed.

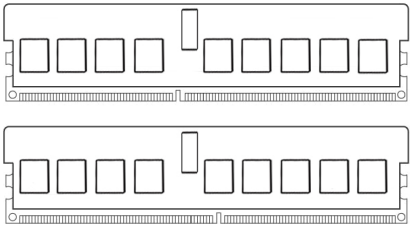
Mounting the Motherboard



2.7 Installing the Memory

Before installing memory, ensure that the memory you have is compatible with the motherboard and processor. Check the TYAN Web site at http://**www.tyan.com** for details of the type of memory recommended for your motherboard.

The following diagram shows common types of DDR3 memory modules.



- Supports R-DIMM, U-DIMM and Low Voltage (LV) DDR3, at 800,1066 or 1333MHz speeds
- All installed memory will automatically be detected and no jumpers or settings need changing
- All memory must be of the **same type and density**

Recommended Memory Population Table

	Single CPU Installed (CPU0 only)						Dual CPU installed (CPU0 and CPU1)								
Quantity of memory installed	**1**	**2**	**3**	**4**	**6**	**8**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**10**	**12**
CPU0_DIMM(1)D0						√									√
CPU0_DIMM(2)D1				√	√	√						√	√	√	√
CPU0_DIMM(3)C0						√									√
CPU0_DIMM(4)C1			√	√	√	√				√	√	√	√	√	√
CPU0_DIMM(5)B0					√	√								√	√
CPU0_DIMM(6)B1		√	√	√	√	√		√	√	√	√	√	√	√	√
CPU0_DIMM(7)A0					√	√								√	√
CPU0_DIMM(8)A1	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√
CPU1_DIMM(12)D0													√	√	√
CPU1_DIMM(11)C0											√	√	√	√	√
CPU1_DIMM(10)B0									√	√	√	√	√	√	√
CPU1_DIMM(9)A0							√	√	√	√	√	√	√	√	√

NOTE:

1. √ indicates a populated DIMM slot.
2. Paired memory installation for Max performance.
3. Populate the same DIMM type in each channel, specifically
   - Use the same DIMM size
   - Use the same # of ranks per DIMM
4. Dual-rank DIMMs are recommended over single-rank DIMMs
5. Un-buffered DIMM can offer slightly better performance than registerd DIMM if populating only a single DIMM per channel
6. We don't suggest other memory installation.
7. AMD 6200 series CPU doesn't support Quad-ranks U-DIMM.

U-DIMM Module Support

DDR3 Speed/Voltage			DDR3 Rank Configuration		
1.25v	1.35v	1.5v	CPU0_DIMM0 (A0, B0, C0, D0)	CPU1_DIMM1 (A1, B1, C1, D1)	CPU1_DIMM0 (A0, B0, C0, D0)
800MHz	800MHz	800MHz	SR and DR	SR and DR	n/a
800MHz	800MHz	800MHz	SR and DR	SR and DR	SR and DR
1066MHz	1066MHz	1066MHz	SR and DR	SR and DR	n/a
1066MHz	1066MHz	1066MHz	SR and DR	SR and DR	SR and DR
1333MHz	n/a	n/a	SR and DR	SR and DR	n/a
1333MHz	n/a	n/a	SR and DR	SR	SR
n/a	1333MHz	1333MHz	SR and DR	SR and DR	n/a
n/a	1333MHz	1333MHz	SR and DR	SR and DR	SR and DR
n/a	1600MHz	n/a	SR and DR	n/a	n/a
n/a	n/a	1600MHz	SR and DR	SR and DR	n/a
n/a	n/a	1600MHz	SR and DR	SR	SR

NOTE:

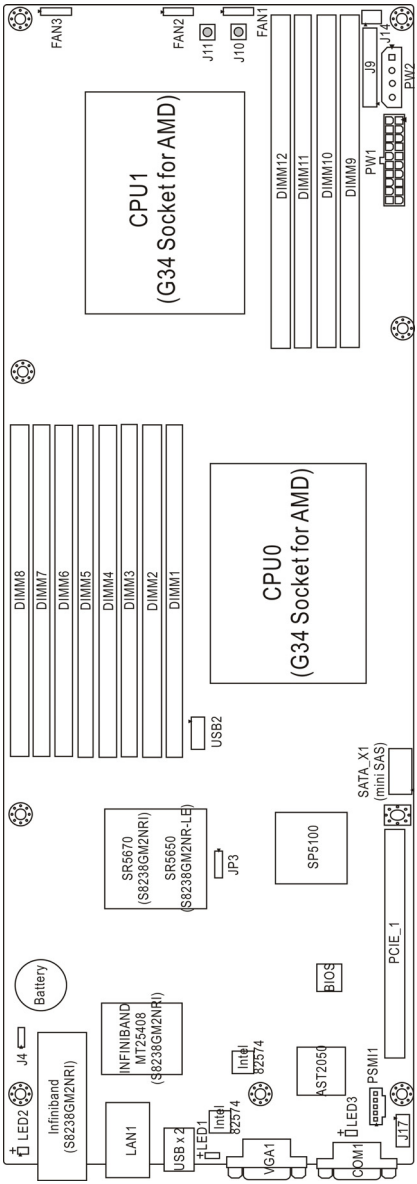
- UDIMM can support up to 4GB sized DIMM's
- Maximum of 8GB per channel
- SR and DR UDDR3 module support **only**
- x8 DRAM module support **only**
- SR and DR 1.25v Memory MAX speed of 1333MHz in a dual channel configuration
- SR and DR 1.35v Memory MAX speed of 1333MHz in a dual channel configuration
- SR and DR 1.5v Memory MAX speed of 1600MHz in a dual channel configuration

R-DIMM Module Support

DDR3 Speed/Voltage			DDR3 Rank Configuration		
1.25v	1.35v	1.5v	DIMM0 (A0, B0, C0, D0)	DIMM1 (A1, B1, C1, D1)	DIMM0 (A0, B0, C0, D0)
800MHz	800MHz	800MHz	SR, DR and QR	SR, DR and QR	n/a
800MHz	800MHz	800MHz	SR, DR and QR	SR, DR and QR	SR, DR and QR
1066MHz	1066MHz	n/a	SR, DR and QR	SR, DR and QR	n/a
1066MHz	1066MHz	n/a	SR, DR and QR	SR and DR	SR and DR
n/a	n/a	1066MHz	SR, DR and QR	SR, DR and QR	n/a
n/a	n/a	1066MHz	SR, DR and QR	SR, DR and QR	SR, DR and QR
1333MHz	n/a	n/a	SR and DR	SR and DR	n/a
1333MHz	n/a	n/a	SR and DR	SR	SR
n/a	1333MHz	n/a	SR, DR and QR	SR and DR	n/a
n/a	1333MHz	n/a	SR, DR and QR	SR and DR	SR and DR
n/a	n/a	1333MHz	SR, DR and QR	SR, DR and QR	n/a
n/a	n/a	1333MHz	SR, DR and QR	SR and DR	SR and DR
n/a	1600MHz	n/a	SR and DR	n/a	n/a
n/a	n/a	1600MHz	SR and DR	SR and DR	n/a
n/a	n/a	1600MHz	SR and DR	SR	SR

NOTE:

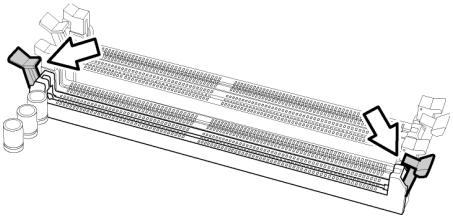
- RDIMM can support up to 16GB sized DIMM's
- SR and DR Memory has a MAX amount of 16GB per channel
- SR and DR 1.25v Memory MAX speed of 1333MHz in a dual channel configuration
- SR and DR 1.35v Memory MAX speed of 1333MHz in a dual channel configuration
- SR and DR 1.5v Memory MAX speed of 1600MHz in a dual channel configuration
- QR Memory has a MAX amount of 32GB per channel
- QR 1.25v Memory MAX speed of 1066MHz in a dual channel configuration
- QR 1.35v Memory MAX speed of 1066MHz in a dual channel configuration
- QR 1.5v Memory MAX speed of 1333MHz in a dual channel configuration


FAN3
FAN2
FAN1
J11
J10
J14
J9
PW2
PW1
CPU1
(G34 Socket for AMD)
DIMM12
DIMM11
DIMM10
DIMM9
DIMM8
DIMM7
DIMM6
DIMM5
DIMM4
DIMM3
DIMM2
DIMM1
CPU0
(G34 Socket for AMD)
USB2
SATA_X1
(mini SAS)
SR5670
(S8238GM2NRI)
SR5650
(S8238GM2NR-LE)
JP3
SP5100
PCIE_1
BIOS
AST2050
PSMI1
LED3
COM1
J17
LED2
J4
Battery
Infiniband
(S8238GM2NRI)
INFINIBAND
MT25408
(S8238GM2NRI)
Intel
82574
LAN1
LED1
USB x 2
VGA1

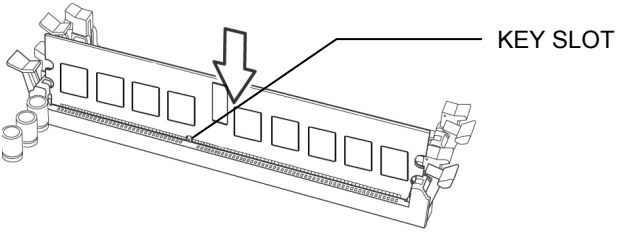
Memory Installation Procedure

Follow these instructions to install memory modules into the S8238.

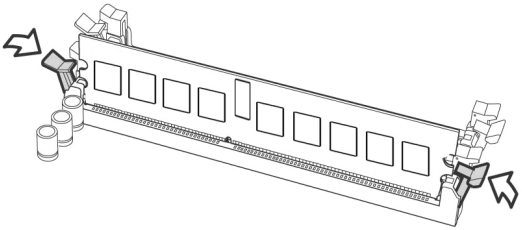
1. Press the locking levers in the direction shown in the following illustration.



2. Align the memory module with the socket. The memory module is keyed to fit only one way in the socket.



3. Seat the module firmly into the socket by gently pressing down until it sits flush with the socket. The locking levers pop up into place.

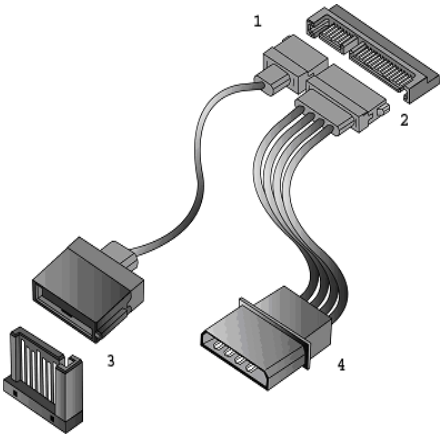


2.8 Attaching Drive Cables

Attaching Serial ATA Cables

S8238 is equipped with four Serial ATA (SATA) channel. Connections for the drives are very simple.
There is no need to set Master/Slave jumpers on SATA drives.
If you are in need of SATA/SAS cables or power adapters please contact your place of purchase.

The following pictures illustrate how to connect an SATA drive.



1. SATA drive cable connection

2. SATA drive power connection

3. SATA cable motherboard connector

4. SATA drive power adapter

2.9 Installing Add-In Cards

Before installing add-in cards, it's helpful to know if they are fully compatible with your motherboard. For this reason, we've provided the diagrams below, showing the slots that may appear on your motherboard.

PCI-E Gen. 2 x16 slot

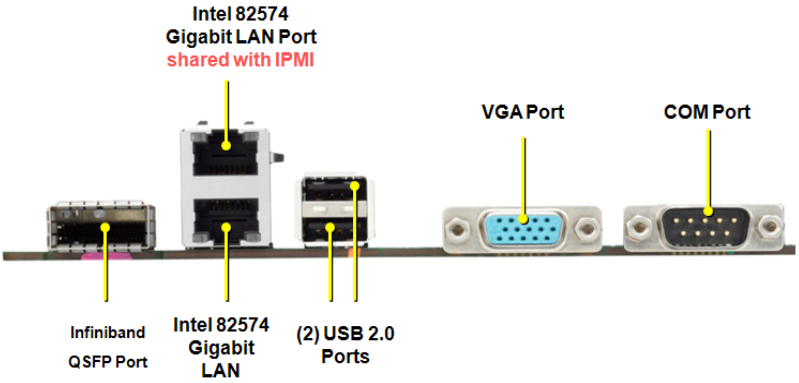
Simply find the appropriate slot for your add-in card and insert the card firmly. Do not force any add-in cards into any slots if they do not seat in place. It is better to try another slot or return the faulty card rather than damaging both the motherboard and the add-in card.

TIP: It's a good practice to install add-in cards in a staggered manner rather than making them directly adjacent to each other. Doing so allows air to circulate within the chassis more easily, thus improving cooling for all installed devices.

NOTE: You must always unplug the power connector to the motherboard before performing system hardware changes to avoid damaging the board or expansion device.

2.10 Connecting External Devices

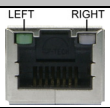
Connecting external devices to the motherboard is an easy task. The motherboard supports a number of different interfaces through connecting peripherals. See the following diagrams for the details.



NOTE: Peripheral devices can be plugged straight into any of these ports but software may be required to complete the installation.

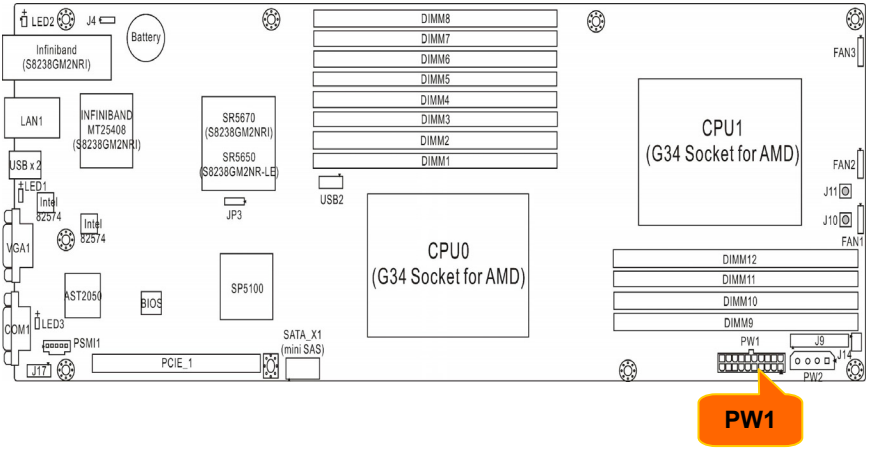
Onboard LAN LED Color Definition

The **two** onboard Ethernet ports have green and yellow LEDs to indicate LAN status. The chart below illustrates the different LED states.

10/100/1000 Mbps LAN Link/Activity LED Scheme			
		**Left LED**	**Right LED**
10 Mbps	**Link**	Green	Off
	Active	Blinking Green	Off
100 Mbps	**Link**	Green	Green
	Active	Blinking Green	Green
1000 Mbps	**Link**	Green	Yellow
	Active	Blinking Green	Yellow
No Link		Off	Off

2.11 Installing the Power Supply

The S8238 motherboard requires a proprietary power supply. This product does not follow a standard ATX, ATX12v or EPS12v power connector specification. Only the PW1 20-pin connector is required to properly power the S8238.



TYAN recommends the use of YR190 B8238-X2 Transport System for a complete barebones solution that includes chassis, power supply and motherboard solution. If a separate design is required, the 20-pin proprietary connector design would need to follow the outline below. TYAN would also suggest a minimum of 450w per node minimum.

PW1: J16 20-Pin Power Connector (Proprietary Design)

Signal	Pin	Pin	Signal
GND	1	2	GND
GND	3	4	GND
GND	5	6	NC
GND	7	8	+12V
GND	9	10	+12V
PSON	11	12	5VSB
GND	13	14	GND
GND	15	16	NC
+12V	17	18	+12V
+12V	19	20	+12V

PWR 2: J34 4-Pin Molex Power Connector (Barebones use only)

Signal	Pin	Pin	Signal
+12V	1	2	GND
GND	3	4	+5V

The 4-pin Molex Power Connector is provided for exclusive use with the TYAN YR190-B8238-X2 barebones solution to provide power for the HDD backplane.

2.12 Finishing Up

Congratulations on making it this far! You have finished setting up the hardware aspect of your computer. Before closing up your chassis, make sure that all cables and wires are connected properly, especially IDE cables and most importantly, jumpers. You may have difficulty powering on your system if the motherboard jumpers are not set correctly.

In the rare circumstance that you have experienced difficulty, you can find help by asking your vendor for assistance. If they are not available for assistance, please find setup information and documentation online at our website or by calling your vendor's support line.

NOTE

Chapter 3: BIOS Setup

3.1 About the BIOS

The BIOS is the basic input/output system, the firmware on the motherboard that enables your hardware to interface with your software. The BIOS determines what a computer can do without accessing programs from a disk. The BIOS contains all the code required to control the keyboard, display screen, disk drives, serial communications, and a number of miscellaneous functions. This chapter describes the various BIOS settings that can be used to configure your system.

The BIOS section of this manual is subject to change without notice and is provided for reference purposes only. The settings and configurations of the BIOS are current at the time of print and are subject to change, and therefore may not match exactly what is displayed on screen.

This section describes the BIOS setup program. The setup program lets you modify basic configuration settings. The settings are then stored in a dedicated, battery-backed memory (called NVRAM) that retains the information even when the power is turned off.

To start the BIOS setup utility:

1. Turn on or reboot your system.
2. Press <Del> during POST (F4 on remote console) to start the BIOS setup utility.

3.1.1 Setup Basics

The table below shows how to navigate in the setup program using the keyboard.

Key	Function
Tab	Moves from one selection to the next
Left/Right Arrow Keys	Changes from one menu to the next
Up/Down Arrow Keys	Moves between selections
Enter	Opens highlighted section
PgUp/PgDn Keys	Changes settings.

3.1.2 Getting Help

Pressing [**F1**] will display a small help window that describes the appropriate keys to use and the possible selections for the highlighted item. To exit the Help Window, press [**ESC**] or the [**F1**] key again.

3.1.3 In Case of Problems

If you have trouble booting your computer after making and saving the changes with the BIOS setup program, you can restart the computer by holding the power button down until the computer shuts off (usually within 4 seconds); resetting by pressing CTRL-ALT-DEL; or clearing the CMOS.
The best advice is to only alter settings that you thoroughly understand. In particular, do not change settings in the Chipset section unless you are absolutely sure of what you are doing. The Chipset defaults have been carefully chosen either by MiTAC or your system manufacturer for best performance and reliability. Even a seemingly small change to the Chipset setup options may cause the system to become unstable or unusable.

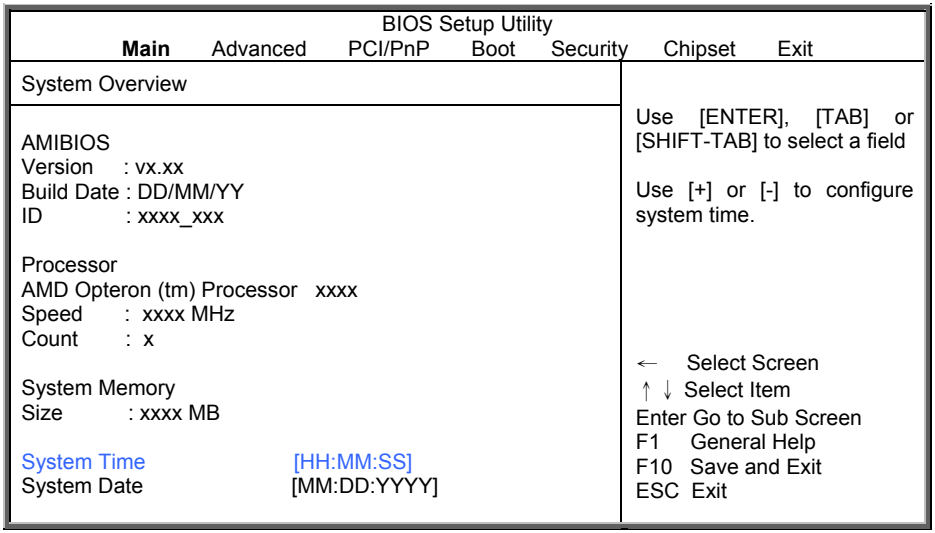
3.1.4 Setup Variations

Not all systems have the same BIOS setup layout or options. While the basic look and function of the BIOS setup remains more or less the same for most systems, the appearance of your Setup screen may differ from the charts shown in this section. Each system design and chipset combination requires a custom configuration. In addition, the final appearance of the Setup program depends on the system designer. Your system designer may decide that certain items should not be available for user configuration, and remove them from the BIOS setup program.

NOTE: The following pages provide the details of BIOS menu. Please be noticed that the BIOS menu are continually changing due to the BIOS updating. The BIOS menu provided are the most updated ones when this manual is written. Please visit TYAN's website at http://www.tyan.com for the information of BIOS updating.

3.2 Main Menu

In this section, you can alter general features such as the date and time.
Note that the options listed below are for options that can directly be changed within the Main Setup screen.



AMIBIOS
It displays the core number, date of BIOS build and the version of BIOS.

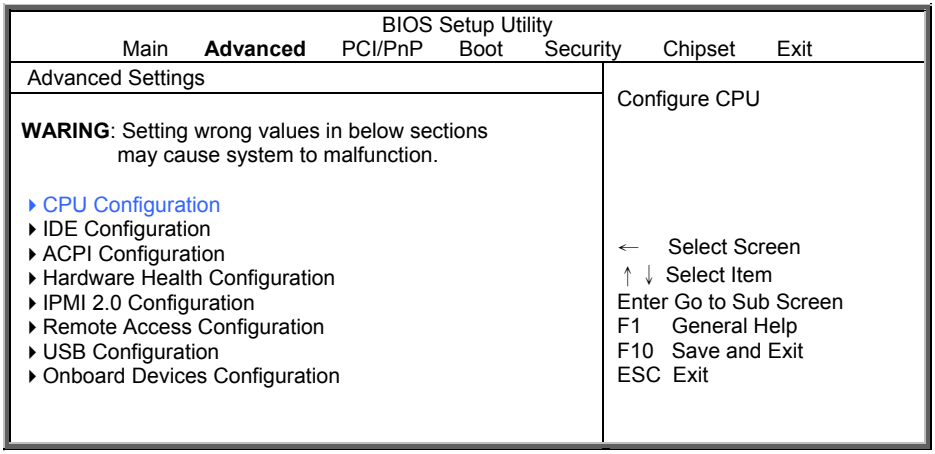
Processor
This displays the CPU information.

System Memory
This displays the amount of system memory present on the system.

System Time / Date setup
System Time: Adjusts the system clock.
HH (24 hours format): MM (Minutes): SS (Seconds)
System Date: Adjusts the system date.
MM (Months): DD (Days): YYYY (Years)

3.3 Advanced Menu

This section facilitates configuring advanced BIOS options for your system.



CPU Configuration
Configure CPU.

IDE Configuration
Configure the IDE devices.

ACPI Configuration
Selection for Advanced ACPI Configuration.

Hardware Health Configuration
Configure / monitor the Hardware Health.

IPMI 2.0 Configuration
IPMI configuration including server monitoring and event log.

Remote Access Configuration
Configure Remote Access.

USB Configuration
Configure the USB support.

Onboard Devices Configuration
Onboard Devices and PCI Add-On cards Enable/Disable.

3.3.1 Advanced CPU Configuration

This section allows you to fine-tune the processor options.

BIOS Setup Utility Main **Advanced** PCI/PnP Boot Security Chipset Exit	
CPU Configuration Module Version: x.xxxx.x Socket Count: xxxx Node Count: xxxx Core Count: xxxx	This should be enabled in order to enable or disable the "Enhanced Halt State".
CPU Information AMD Opteron (tm) Processor xxxx Revision: D1 Cache L1: xxKB Cache L2: xxxxKB Cache L3: xxxxKB Speed: xxxx , NB Clk: xxxx Able to change Freq.: Yes uCode Patch Level: xxxx	[CPU Socket x]
GART Error Reporting Secure Virtual Machine Mode PowerNow CState Mode PowerCap CPB Mode ACPI SRAT Table C1E Support	[Disabled] [Enabled] [Enabled] [C6] [P-state 0] [Auto] [Enabled] [Auto]
	← Select Screen ↑ ↓ Select Item Enter Go to Sub Screen F1 General Help F10 Save and Exit ESC Exit

GART Error Reporting
This option should remain disabled for normal operation. The driver developer may enable it for the purpose of testing.
Disabled / Enabled

Secure Virtual Machine Mode
Enable/disable the CPU secure virtual machine mode (SVM).
Disabled / **Enabled**

PowerNow
Enable/disable the generation of ACPI_PPC, _PSS, and _PCT objects.
Disabled / **Enabled**

CState Mode
Specify the method of C-State Enablement.
Disabled / **C6**

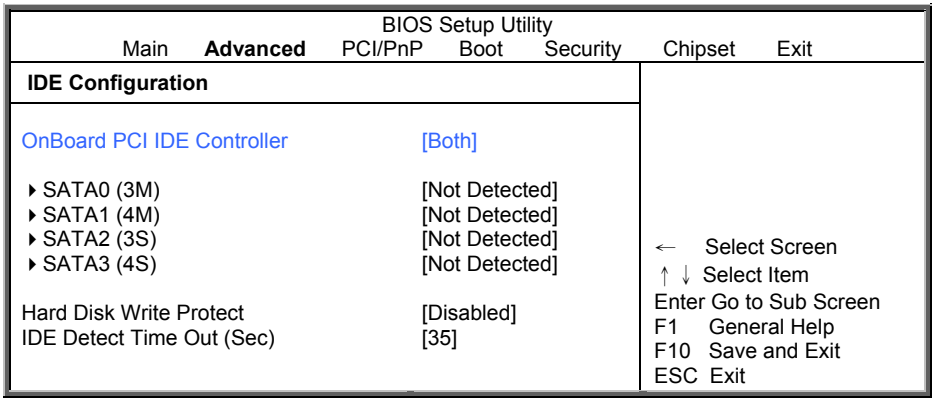
PowerCap
The option can decide the highest performance P-state in OS.
P-state 0 / P-state 1 / P-state 2 / P-state 3 / P-state 4

CPB Mode
Specify the method of core performance boost enablement.
Disabled / **Auto**

ACPI SRAT Table
Enable or disable the building of ACPI SRAT Table.
Disabled / **Enabled**

C1E Support
Enable or disable the C1 Enhanced mode.
Disabled / **Auto**

3.3.2 Advanced IDE Configuration

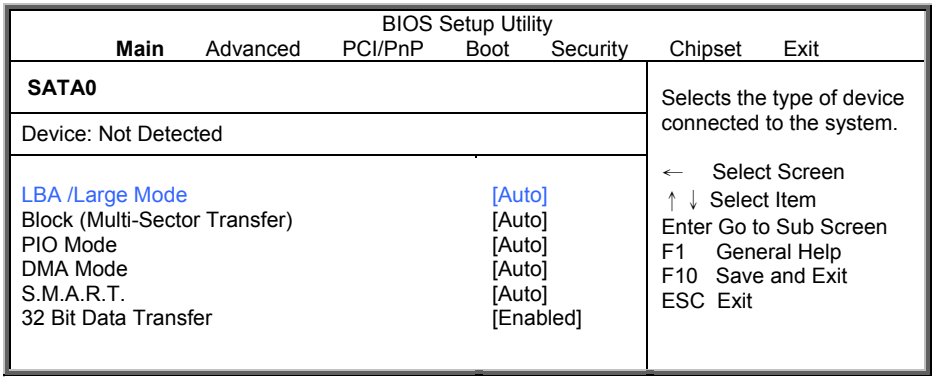

BIOS Setup Utility
Main Advanced PCI/PnP Boot Security Chipset Exit
IDE Configuration
OnBoard PCI IDE Controller [Both]
SATA0 (3M) [Not Detected]
SATA1 (4M) [Not Detected]
SATA2 (3S) [Not Detected]
SATA3 (4S) [Not Detected]
Hard Disk Write Protect [Disabled]
IDE Detect Time Out (Sec) [35]
← Select Screen
↑ ↓ Select Item
Enter Go to Sub Screen
F1 General Help
F10 Save and Exit
ESC Exit

Onboard PCI IDE Controller
Disabled: disables the integrated IDE Controller
Primary: enables only the Primary IDE Controller
Secondary: enables only the Secondary IDE Controller
Both: enables both IDE Controller
Disabled **/** Primary / Secondary **/ Both**

Hard Disk Write Protect
Disable/Enable device write protection. This will be effective only if device is accessed through BIOS.
Disabled / Enabled

IDE Detect Time Out (Sec)
Select the time out value for detecting ATA/ATAPI device(s).
0~35 (at 5 interval)

3.3.2.1 SATA0 Sub-Menu



Type
Selects the type of device connected to the system.
Auto / Disabled

LBA/Large Mode
Auto: Enabled LBA Mode if the device supports it and the device is not already formatted with LBA Mode disabled.
Disabled: Disabled LBA Mode.
Auto / Disabled

Block (Multi-Sector Transfer)
Disabled: The Data transfer from and to the device occurs one sector at a time.
Auto: The Data transfer from and to the device occurs multiple sectors at a time if the device supports it.
Auto / Disabled

PIO Mode
Select the PIO Mode. Select Auto to enhance hard disk performance by optimizing the hard disk timing.
Auto / 0~4 (at 1 interval)

DMA Mode
Select DMA Mode.
Auto: Auto detected.
Auto / Disabled

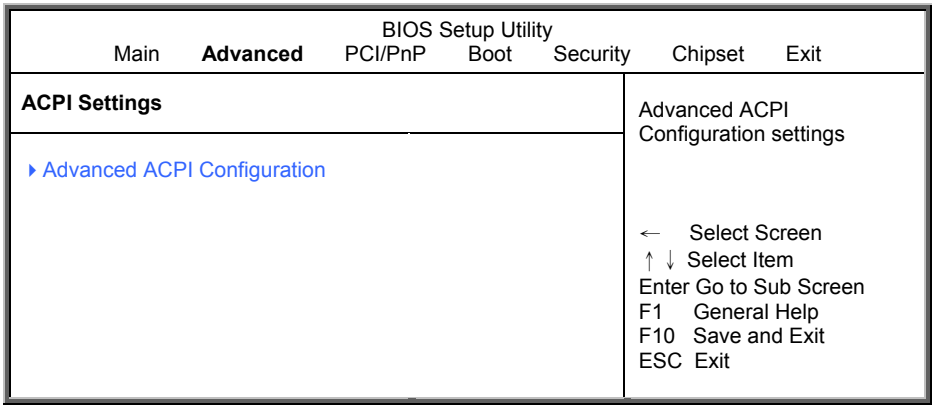
S.M.A.R.T
S.M.A.R.T (Self-Monitoring Analysis and Reporting Technology) is a utility that monitors your disk status to predict hard disk failure.
Auto / Disabled / Enabled

32-Bit Data Transfer

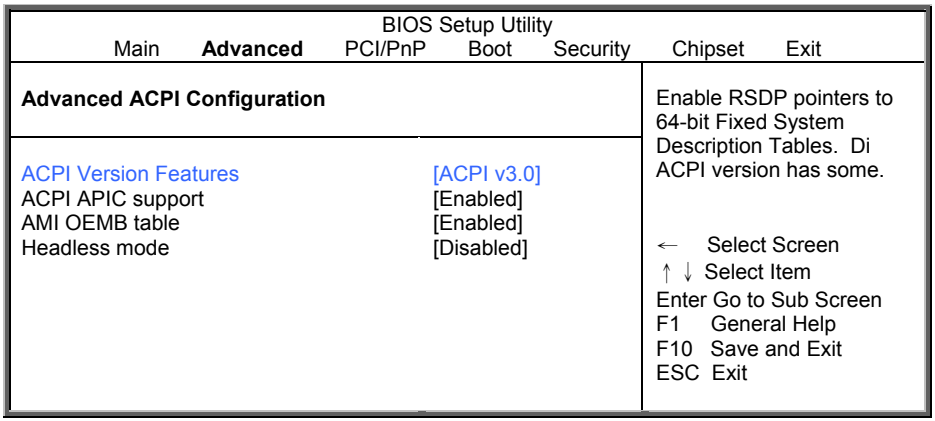
Enable 32-bit to maximize the IDE hard disk data transfer rate.

Enabled / Disabled

3.3.3 ACPI Configuration



3.3.3.1 Advanced ACPI Configuration


BIOS Setup Utility
Main Advanced PCI/PnP Boot Security Chipset Exit
Advanced ACPI Configuration
ACPI Version Features [ACPI v3.0]
ACPI APIC support [Enabled]
AMI OEMB table [Enabled]
Headless mode [Disabled]
Enable RSDP pointers to 64-bit Fixed System Description Tables. Di ACPI version has some.
← Select Screen
↑ ↓ Select Item
Enter Go to Sub Screen
F1 General Help
F10 Save and Exit
ESC Exit

ACPI Version Features
Set this value to allow or prevent the system to be complaint with the ACPI 2.0 specification.

ACPI 3.0 / ACPI 2.0 / ACPI 1.0

ACPI APIC Support
This option allows you to define whether or not to enable APIC features.

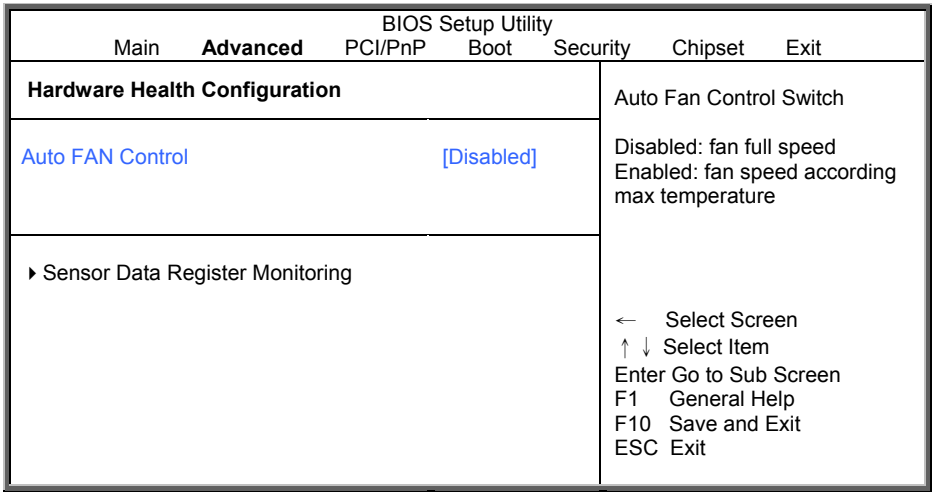
Enabled / Disabled

AMI OEMB Table
Set this value to allow the ACPI BIOS to add a pointer to an OEMB table in the Root System Description Table (RSDT) table.
Enabled / Disabled

NOTE: OEMB table is used to pass POST data to the AMI code during ACPI O/S operations.

Headless Mode
Enable or disable Headless operation mode through ACPI.
Disabled / Enabled

3.3.4 Hardware Health Configuration


BIOS Setup Utility
Main Advanced PCI/PnP Boot Security Chipset Exit
Hardware Health Configuration
Auto FAN Control [Disabled]
Sensor Data Register Monitoring
Auto Fan Control Switch
Disabled: fan full speed
Enabled: fan speed according max temperature
← Select Screen
↑ ↓ Select Item
Enter Go to Sub Screen
F1 General Help
F10 Save and Exit
ESC Exit

Auto Fan Control
Disabled: Fan full speed
Enabled: Fan speed according max temperature
Enabled / **Disabled**

3.4.1 Sensor Data Register Monitoring

BIOS Setup Utility

Main **Advanced** PCI/PnP Boot Security Chipset Exit

ID#	NAME	READING	STATUS
01	CPU Temp 0	xx	OK
02	CPU Temp 1	xx	OK
03	SR5670 Case	xx	OK
04	SB Area Temp	xx	OK
05	IB Area Temp	xx	OK
06	System Ambient	xx	OK
07	CPU0 MOS Area	xx	OK
08	CPU1 MOS Area	xx	OK
0A	VCCP_P0	xx	OK
0B	VCCP_P1	xx	OK
0C	VDDNB_P0	xx	OK
0D	VDDNB_P1	xx	OK
0E	VDDIO_P0	xx	OK
0F	VDDIO_P1	xx	OK
10	VCC3	xx	OK
11	V3AUX	xx	OK
12	VBAT	xx	OK

▸ SDR Monitoring Next Page

Press Enter key to display remain sensor

ESC key to return this page

← Select Screen
↑ ↓ Select Item
Enter Go to Sub Screen
F1 General Help
F10 Save and Exit
ESC Exit

▸ SDR Monitoring Next Page

BIOS Setup Utility

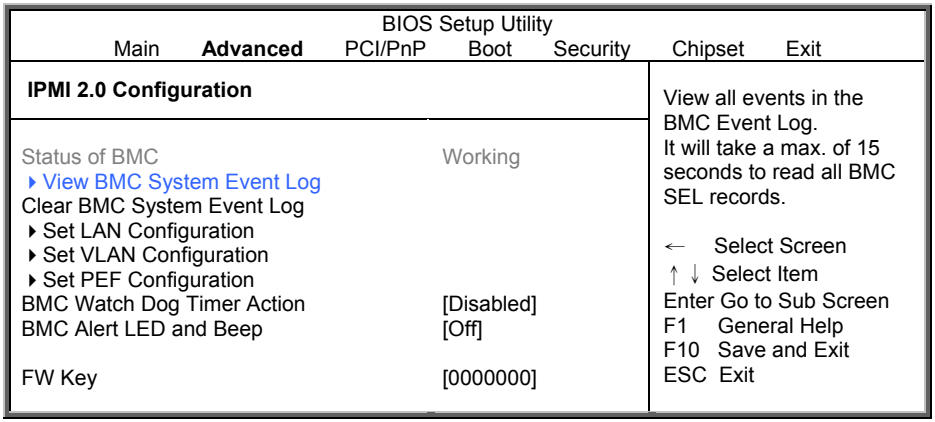
Main **Advanced** PCI/PnP Boot Security Chipset Exit

ID#	NAME	READING	STATUS
20	Sys. 1	xx	OK
21	Sys. 2	xx	OK
22	Sys. 3	xx	OK
23	Sys. 4	xx	OK
24	Sys. 5	xx	OK
25	Sys. 6	xx	OK
47	ID_BTN_STATUS_L	xx	OK
46	PLTRST2_N	xx	OK

← Select Screen
↑ ↓ Select Item
Enter Go to Sub Screen
F1 General Help
F10 Save and Exit
ESC Exit

Read only. It can not be modified in user mode.

3.3.5 IPMI 2.0 Configuration



Status of BMC
Read only.

Clear BMC System Event Log
Clear all events in BMC System Event Log.

Set LAN Configuration
Set LAN Configuration Parameters Command.

Set VLAN Configuration
Set VLAN Configuration Parameters Command.

Set PEF Configuration
Set PEF Configuration Parameters Command.

BMC Watch Dog Timer Action
Allows the BMC to reset or power down the system if the operating system crashes or hangs.

Disabled / Reset System / Power Down / Power Cycle

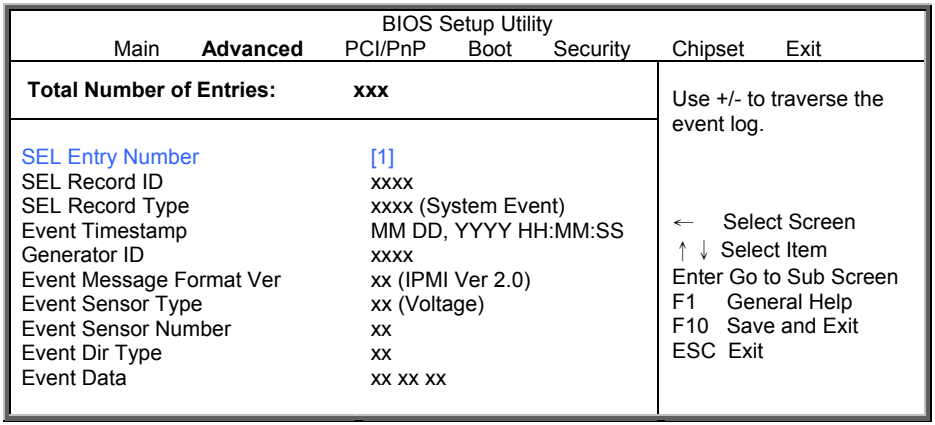
BMC Alert LED and Beep
BMC Alert LED and Beep.

OFF / ON

FW Key
Enter IPMI FW Key upgrade to IPMI or iKVM function.

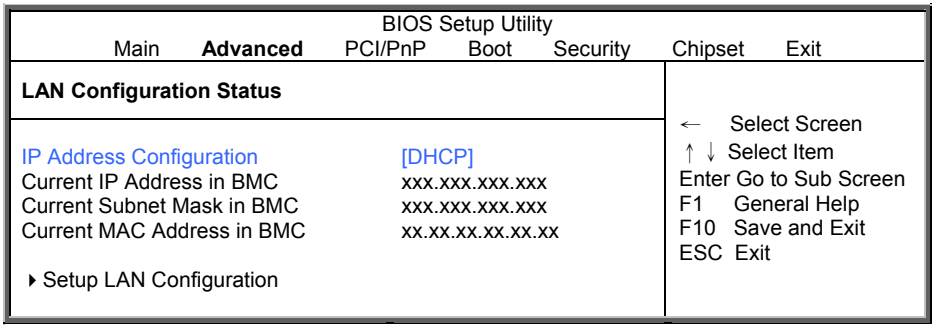
[0000000]

3.3.5.1 View BMC System Event Log


BIOS Setup Utility
Main Advanced PCI/PnP Boot Security Chipset Exit
Total Number of Entries: xxx
Use +/- to traverse the event log.
SEL Entry Number [1]
SEL Record ID xxxx
SEL Record Type xxxx (System Event)
Event Timestamp MM DD, YYYY HH:MM:SS
Generator ID xxxx
Event Message Format Ver xx (IPMI Ver 2.0)
Event Sensor Type xx (Voltage)
Event Sensor Number xx
Event Dir Type xx
Event Data xx xx xx
← Select Screen
↑ ↓ Select Item
Enter Go to Sub Screen
F1 General Help
F10 Save and Exit
ESC Exit

Read only. It can not be modified in user mode.

3.3.5.2 Set LAN Configuration


BIOS Setup Utility
Main Advanced PCI/PnP Boot Security Chipset Exit
LAN Configuration Status
IP Address Configuration [DHCP]
Current IP Address in BMC xxx.xxx.xxx.xxx
Current Subnet Mask in BMC xxx.xxx.xxx.xxx
Current MAC Address in BMC xx.xx.xx.xx.xx.xx
▸ Setup LAN Configuration
← Select Screen
↑ ↓ Select Item
Enter Go to Sub Screen
F1 General Help
F10 Save and Exit
ESC Exit

Read only. It can not be modified in user mode.

3.3.5.2.1 Setup LAN Configuration

BIOS Setup Utility Main **Advanced** PCI/PnP Boot Security Chipset Exit	
Setup LAN Configuration	IPMI IP Address Source STATIC/DHCP
IP Address Configuration [DHCP] Save LAN Configuration	← Select Screen ↑ ↓ Select Item Enter Go to Sub Screen F1 General Help F10 Save and Exit ESC Exit

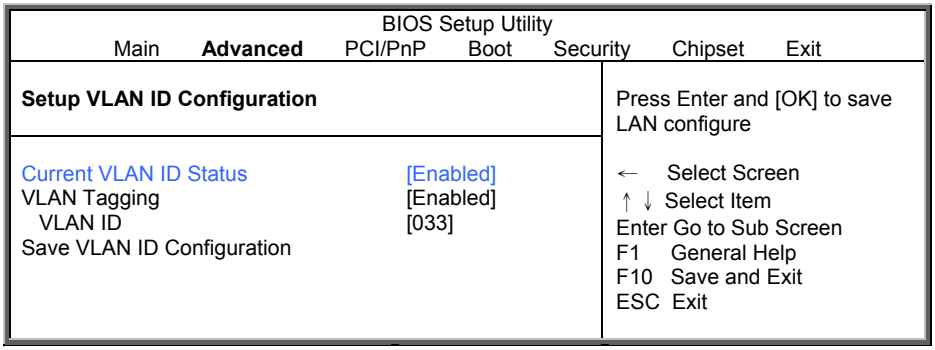
IP Address Source
Select IPMI IP Address Source.
STATIC / DHCP

> **NOTE:**
> **IP Address** and **Subnet Mask** appear when **IP Address Source** is set to [STATIC].

IP Address / Subnet Mask
Enter Static IP Address / Subnet Mask.

Save LAN Configuration
After setup LAN Configuration, select Save LAN Configuration and click [OK] to enable changes.

3.3.5.3 Set VLAN Configuration


BIOS Setup Utility
Main Advanced PCI/PnP Boot Security Chipset Exit
Setup VLAN ID Configuration
Press Enter and [OK] to save LAN configure
Current VLAN ID Status [Enabled]
VLAN Tagging [Enabled]
VLAN ID [033]
Save VLAN ID Configuration
← Select Screen
↑ ↓ Select Item
Enter Go to Sub Screen
F1 General Help
F10 Save and Exit
ESC Exit

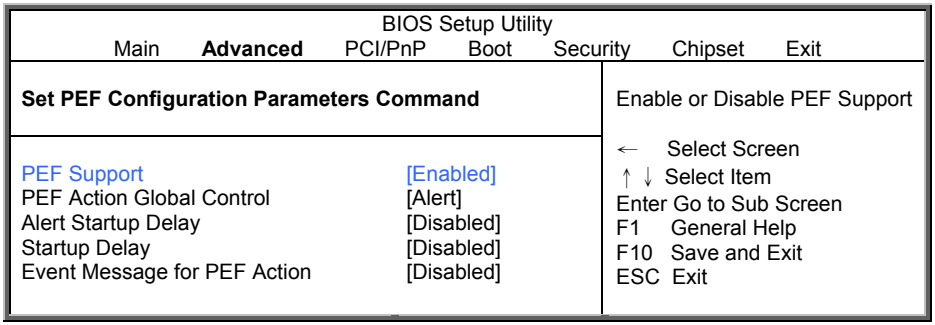
Current VLAN ID Status
Read only. It can not be modified in user mode.

VLAN Tagging
Enable / Disable VLAN Tagging.
Enabled / Disabled

VLAN ID
Enter VLAN ID.

Save VLAN ID Configuration
Press Enter and [OK] to save VLAN configure.
Disabled / Enabled

3.3.5.4 Set PEF Configuration


BIOS Setup Utility
Main Advanced PCI/PnP Boot Security Chipset Exit
Set PEF Configuration Parameters Command
Enable or Disable PEF Support
PEF Support [Enabled]
PEF Action Global Control [Alert]
Alert Startup Delay [Disabled]
Startup Delay [Disabled]
Event Message for PEF Action [Disabled]
← Select Screen
↑ ↓ Select Item
Enter Go to Sub Screen
F1 General Help
F10 Save and Exit
ESC Exit

PEF Support
Enable or disable PEF support.
Enabled / Disabled

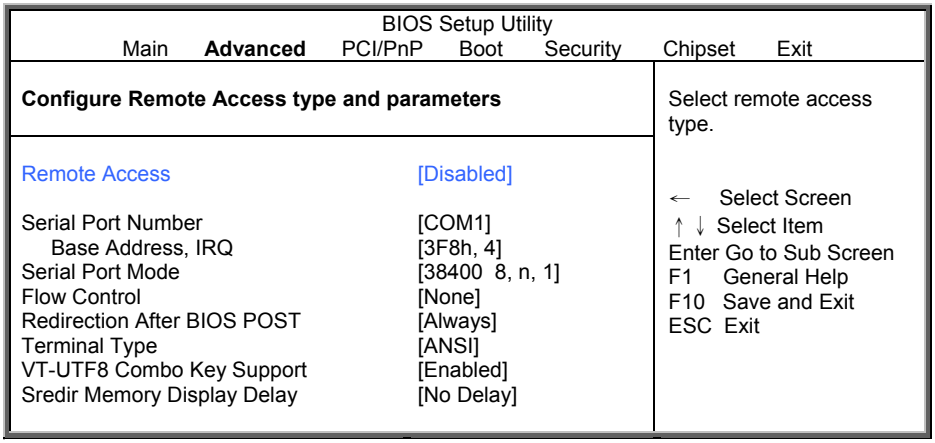
PEF Action Global Control
Select action for PEF Action Global Control.
Alert / Power Down / Reset System / Power Cycle / OEM Action / Diagnostic. Int.

Alert Startup Delay
Enable/disable Alert Startup Delay.
Disabled / Enabled

Startup Delay
Enable/disable Startup Delay.
Disabled / Enabled

Event Message For PEF Action
Enable/disable Event Message for PEF Action.
Disabled / Enabled

3.3.6 Remote Access Configuration


BIOS Setup Utility
Main Advanced PCI/PnP Boot Security Chipset Exit
Configure Remote Access type and parameters
Select remote access type.
Remote Access [Disabled]
Serial Port Number [COM1]
Base Address, IRQ [3F8h, 4]
Serial Port Mode [38400 8, n, 1]
Flow Control [None]
Redirection After BIOS POST [Always]
Terminal Type [ANSI]
VT-UTF8 Combo Key Support [Enabled]
Sredir Memory Display Delay [No Delay]
← Select Screen
↑ ↓ Select Item
Enter Go to Sub Screen
F1 General Help
F10 Save and Exit
ESC Exit

Remote Access
Enables remote access to system through serial port.
Disabled / Enabled

> **NOTE:**
> The following BIOS items are available only when **Remove Access** is set to [Enabled].

Serial Port Number
Select Serial Port for cosole redirection. Make sure the selected port is enabled.
COM1 / COM2

Serial Port Mode
Select Serial Port settings.

Flow Control
Select Flow Control for console redirection.
None / Hardware / Software

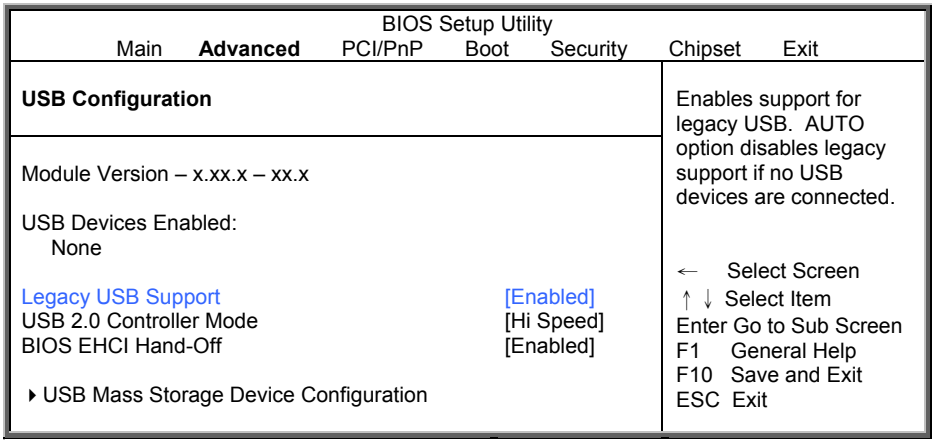
Redirection After BIOS POST
Disabled: Turns off the redirection after POST Boot Loader.
Boot Loader: Redirection is active during POST and during Boot Loader.
Always: Redirection is always active. (Some Oss may not work if set to Always)
Always / Disabled / Boot Loader

Terminal Type
Select the target terminal type.
ANSI / VT100 / VT-UTF8

VT-UTF8 Combo Key Support
Enable VT-UFT8 Combination Key Support for ANSI/VT100 terminals.
Enabled / Disabled

Sredir Memory Display Delay
Gives the delay in seconds to display memory information.
No Delay / Delay 1 Sec / Delay 2 Sec / Delay 4 Sec

3.3.7 USB Configuration


BIOS Setup Utility
Main Advanced PCI/PnP Boot Security Chipset Exit
USB Configuration
Module Version – x.xx.x – xx.x
USB Devices Enabled:
None
Legacy USB Support [Enabled]
USB 2.0 Controller Mode [Hi Speed]
BIOS EHCI Hand-Off [Enabled]
USB Mass Storage Device Configuration
Enables support for legacy USB. AUTO option disables legacy support if no USB devices are connected.
← Select Screen
↑ ↓ Select Item
Enter Go to Sub Screen
F1 General Help
F10 Save and Exit
ESC Exit

Legacy USB Support
Enables support for legacy USB. AUTO option disables legacy support if no USB devices are connected.

Enabled / Disabled / Auto

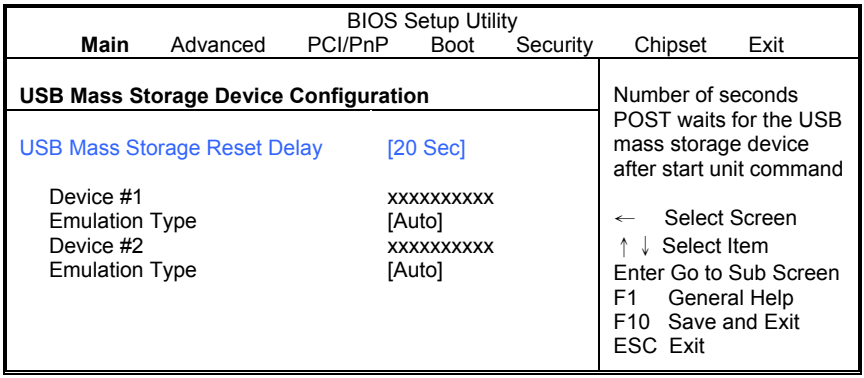
USB 2.0 Controller Mode
Configure the USB 2.0 controller in Hi Speed (480 Mbps) or Full Speed (12Mbps).

Hi Speed / Full Speed

BIOS EHCI Hand-OFF
This is a work around for OSes without EHCI hand-off support. The EHCI ownership change should claim by EHCI driver.

Enabled / Disabled

3.3.7.1 USB Mass Storage Device Configuration


BIOS Setup Utility
Main Advanced PCI/PnP Boot Security Chipset Exit
USB Mass Storage Device Configuration
USB Mass Storage Reset Delay [20 Sec]
Device #1 xxxxxxxxxx
Emulation Type [Auto]
Device #2 xxxxxxxxxx
Emulation Type [Auto]
Number of seconds POST waits for the USB mass storage device after start unit command
← Select Screen
↑ ↓ Select Item
Enter Go to Sub Screen
F1 General Help
F10 Save and Exit
ESC Exit

USB Mass Storage Reset Delay
Number of seconds POST waits for the USB mass storage device after the start unit command.

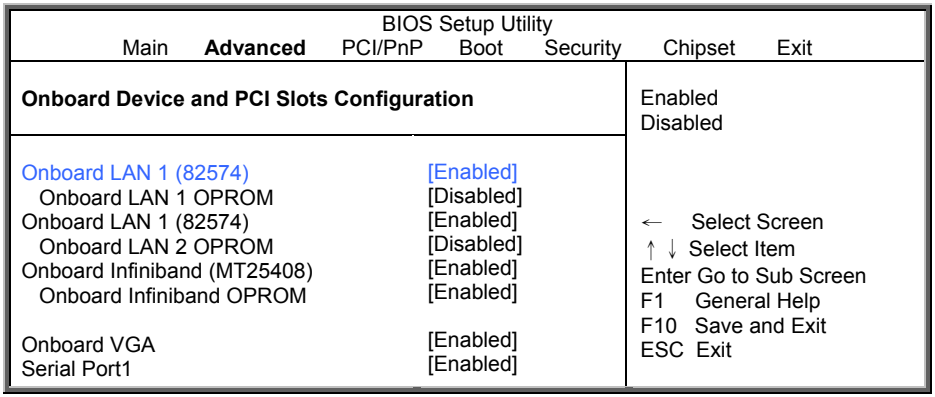
20 Sec / 10 Sec / 30 Sec / 40 Sec

Device #1 / Device #2
Read only. It can not be modified in user mode.

Emulation Type
If Auto, USB devices less than 530 MB will be emulated as Floppy and remaining as hard drive. Forced FDD option can be used to force a HDD formatted drive to boot as FDD (Ex. ZIP drive).

Auto / Floppy / Forced FDD / Hard Disk / CDROM

3.3.8 Onboard Devices Configuration



Onboard Lan1/Lan2 (82574)
Enable /disable Lan controller.
Enabled / Disabled

Onboard Lan1/Lan2 OPROM
Execute Lan OP-ROM or not.
Disabled / Enabled

Onboard Infiniband (MT25408)
Enable /disable Lan controller.
Enabled / Disabled

Onboard Infiniband OPROM
Execute Infiniband OP-ROM or not.
Disabled / Enabled

Onboard VGA
Enable or disable the onboard VGA controller.
Enabled / Disabled

Serial Port1
Enable or disable the serial port 1.
Enabled / Disabled

3.4 PCI/PnP Menu

BIOS Setup Utility Main Advanced **PCI/PnP** Boot Security Chipset Exit	
Advanced PCI/PnP Settings	Clear NVRAM during System Boot.
WARING: Setting wrong values in below sections may cause system to malfunction.	
Clear NVRAM [No] Plug & Play O/S [No] PCI Latency Timer [64] Allocate IRQ to PCI VGA [Yes] Palette Snooping [Disabled] PCI IDE BusMaster [Enabled]	← Select Screen ↑ ↓ Select Item Enter Go to Sub Screen F1 General Help F10 Save and Exit ESC Exit

Clear NVRAM
Clear NVRAM during system Boot.
No / Yes

Plug & Play O/S
No: lets the BIOS configure all the devices in the system.
Yes: lets the operating system configure Plug and Play (PnP) devices not required for boot if your system has a Plug and Play operating system.
No / Yes

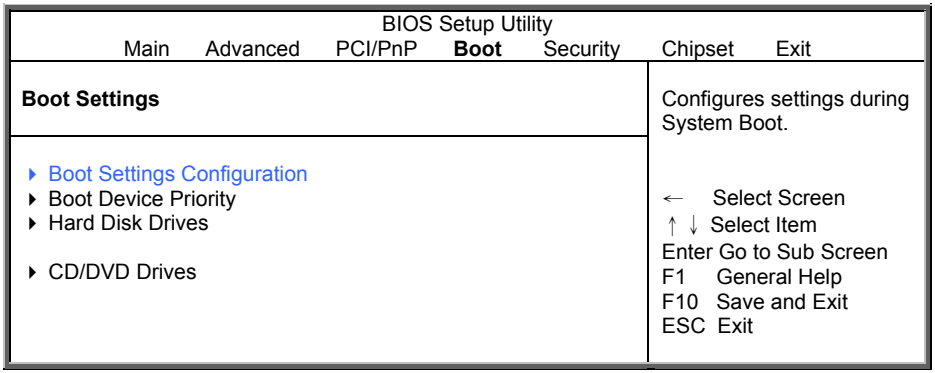
PCI Latency Timer
This setting controls how many PCI clocks each PCI device can hold the bus before another PCI device takes over. When set to higher values, every PCI device can conduct transactions for a longer time and thus improve the effective PCI bandwidth. Values in units of PCI clocks for PCI device latency timer register
64 / 32 / 96 / 128 / 160 / 192 / 224 / 248

Allocate IRQ to PCI VGA
Yes: assigns IRQ to PCI VGA card if card requests IRQ.
Yes / No

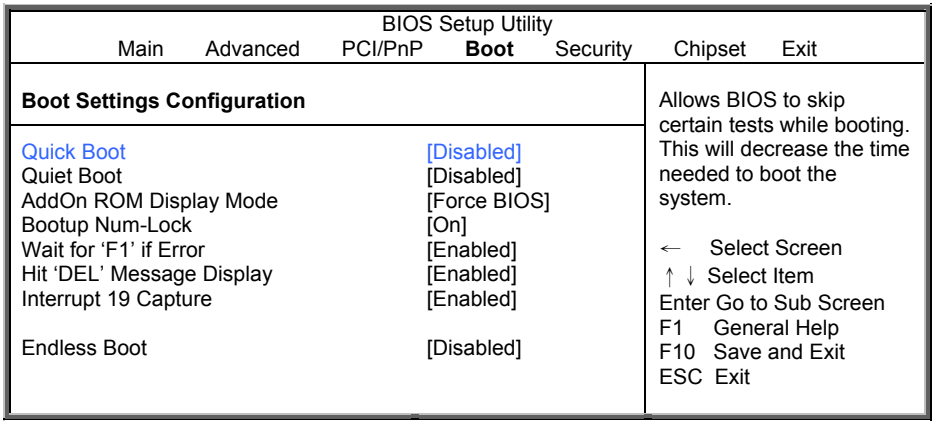
Palette Snooping
This is the default setting and should not be changed unless the VGA card manufacturer requires Palette Snooping to be Enabled.
Enabled: informs the PCI devices that an ISA graphics device is installed in the system so the card will function correctly.
Disabled / Enabled

PCI IDE Bus Master
Enabled: BIOS uses PCI bus mastering for reading / writing to IDE drives.
Enabled / Disabled

3.5 Boot Menu



3.5.1 Boot Settings Configuration


BIOS Setup Utility
Main Advanced PCI/PnP Boot Security Chipset Exit
Boot Settings Configuration
Allows BIOS to skip certain tests while booting. This will decrease the time needed to boot the system.
Quick Boot [Disabled]
Quiet Boot [Disabled]
AddOn ROM Display Mode [Force BIOS]
Bootup Num-Lock [On]
Wait for 'F1' if Error [Enabled]
Hit 'DEL' Message Display [Enabled]
Interrupt 19 Capture [Enabled]
Endless Boot [Disabled]
← Select Screen
↑ ↓ Select Item
Enter Go to Sub Screen
F1 General Help
F10 Save and Exit
ESC Exit

Quick Boot
This option allows user bypass BIOS self test during POST.
Enabled / Disabled

Quiet Boot
Disabled: displays normal POST messages.
Enabled: displays OEM log instead of POST messages.
Disabled / Enabled

Add On ROM Display Mode
Allows user to force BIOS/Option ROM of add-on cards to be displayed during quiet boot.
Force BIOS / Keep Current

Boot Up Num-Lock
Selects Power-on state for Numlock.
On / Off

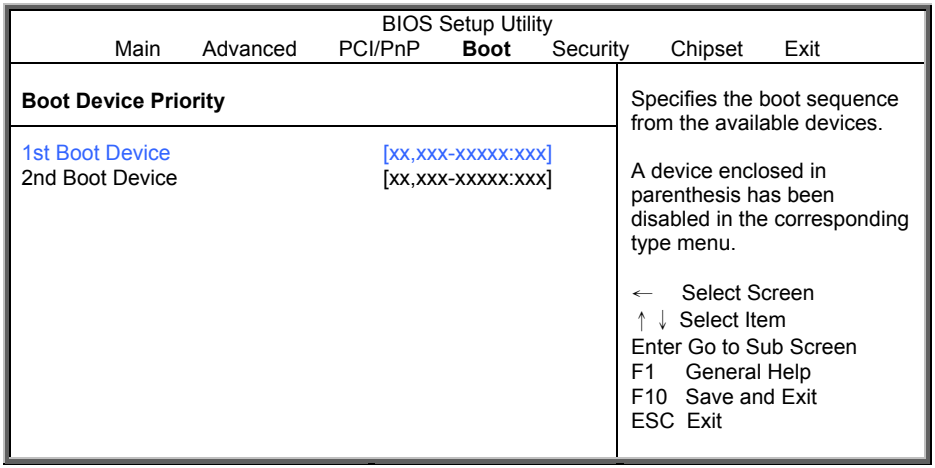
Wait for 'F1' If Error
Waits for F1 key to be present if error occurs.
Enabled / Disabled

Hit 'DEL' Message Display
Displays "Press DEL to run Setup in POST".
Enabled / Disabled

Interrupt 19 Capture
Enabled: allows option ROMs to trap interrupt 19.
Enabled / Disabled

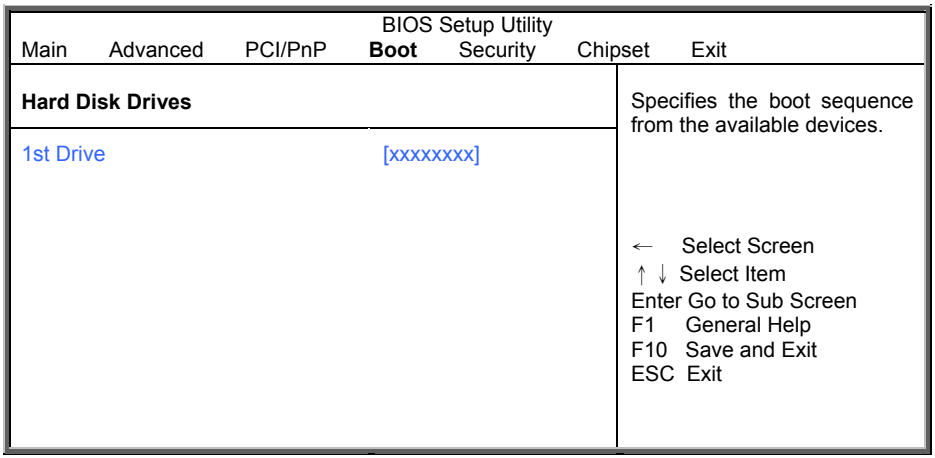
Endless Boot
Enable/Disable endless loop boot from BBS table.
Enabled / Disabled

3.5.2 Boot Device Priority


BIOS Setup Utility
Main Advanced PCI/PnP Boot Security Chipset Exit
Boot Device Priority
1st Boot Device [xx,xxx-xxxxx:xxx]
2nd Boot Device [xx,xxx-xxxxx:xxx]
Specifies the boot sequence from the available devices.
A device enclosed in parenthesis has been disabled in the corresponding type menu.
← Select Screen
↑ ↓ Select Item
Enter Go to Sub Screen
F1 General Help
F10 Save and Exit
ESC Exit

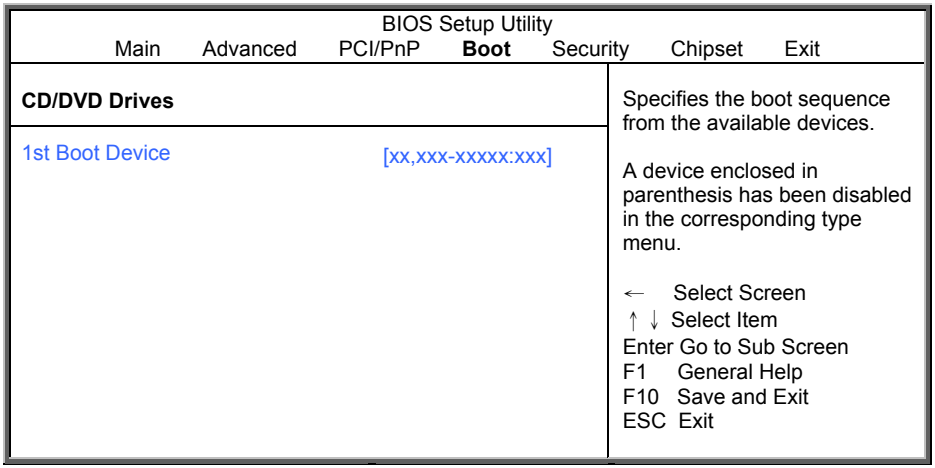
Set your boot device priority. These can be customized depending on your preference.

3.5.3 Hard Disk Drives


BIOS Setup Utility
Main Advanced PCI/PnP Boot Security Chipset Exit
Hard Disk Drives
1st Drive [xxxxxxxx]
Specifies the boot sequence from the available devices.
← Select Screen
↑ ↓ Select Item
Enter Go to Sub Screen
F1 General Help
F10 Save and Exit
ESC Exit

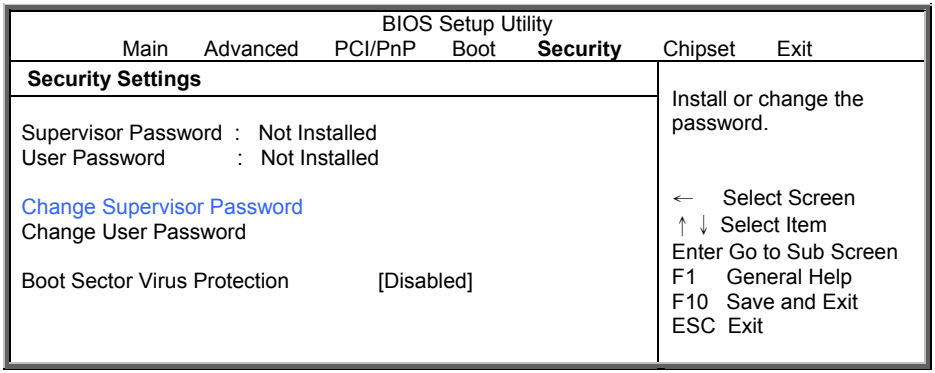
Specify the boot sequence from the available devices.

3.5.4 CD/DVD Drives


BIOS Setup Utility
Main Advanced PCI/PnP Boot Security Chipset Exit
CD/DVD Drives
1st Boot Device
[xx,xxx-xxxxx:xxx]
Specifies the boot sequence from the available devices.
A device enclosed in parenthesis has been disabled in the corresponding type menu.
← Select Screen
↑ ↓ Select Item
Enter Go to Sub Screen
F1 General Help
F10 Save and Exit
ESC Exit

Specify the boot sequence from the available devices.

3.6 Security Menu



Supervisor Password/User Password
Read only.

Change Supervisor Password
Install or change the password.

Change User Password
Install or change the password.

Boot Sector Virus Protection
When it is set to [Enabled], BIOS will issue a virus warning message and beep if a write to the boot sector or the partition table of the HDD is attempted.

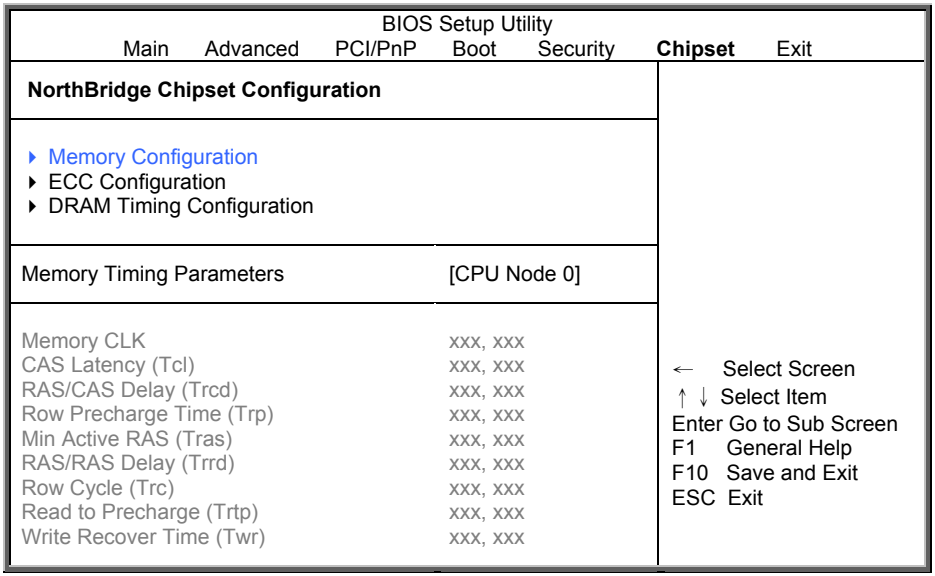
Disabled / Enabled

3.7 Chipset Menu

BIOS Setup Utility Main Advanced PCI/PnP Boot Security **Chipset** Exit	
Advanced Chipset Settings	Configure CPU Bridge features.
WARNING: Setting wrong values in below sections may cause system to malfunction. ▸ NorthBridge Configuration ▸ SouthBridge Configuration ▸ RD890 Configuration	← Select Screen ↑ ↓ Select Item Enter Go to Sub Screen F1 General Help F10 Save and Exit ESC Exit

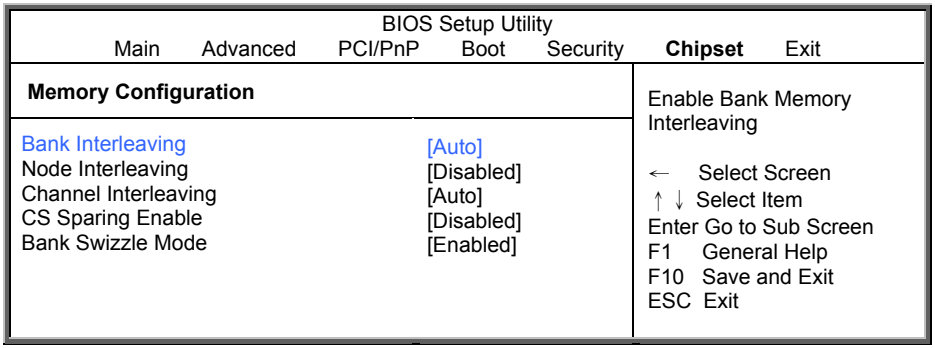
Allow you to change NorthBridge, SouthBridge and RD890 Configuration.

3.7.1 North Bridge Configuration


BIOS Setup Utility
Main Advanced PCI/PnP Boot Security Chipset Exit
NorthBridge Chipset Configuration
Memory Configuration
ECC Configuration
DRAM Timing Configuration
Memory Timing Parameters [CPU Node 0]
Memory CLK xxx, xxx
CAS Latency (Tcl) xxx, xxx
RAS/CAS Delay (Trcd) xxx, xxx
Row Precharge Time (Trp) xxx, xxx
Min Active RAS (Tras) xxx, xxx
RAS/RAS Delay (Trrd) xxx, xxx
Row Cycle (Trc) xxx, xxx
Read to Precharge (Trtp) xxx, xxx
Write Recover Time (Twr) xxx, xxx
← Select Screen
↑ ↓ Select Item
Enter Go to Sub Screen
F1 General Help
F10 Save and Exit
ESC Exit

Memory Timing Parameters
Select which node's timing parameters to display.
CPU Node 0 / CPU Node 1

3.7.1.1 Memory Configuration



Bank Interleaving
Bank Interleave setting has to do with the actual RAM chip properties, most good quality RAM chips have "4-bank interleaving" and work best at this setting. Interleaving controls how actual hits to memory takes place.
Enable Bank Memory Interleaving.
Auto / Disabled

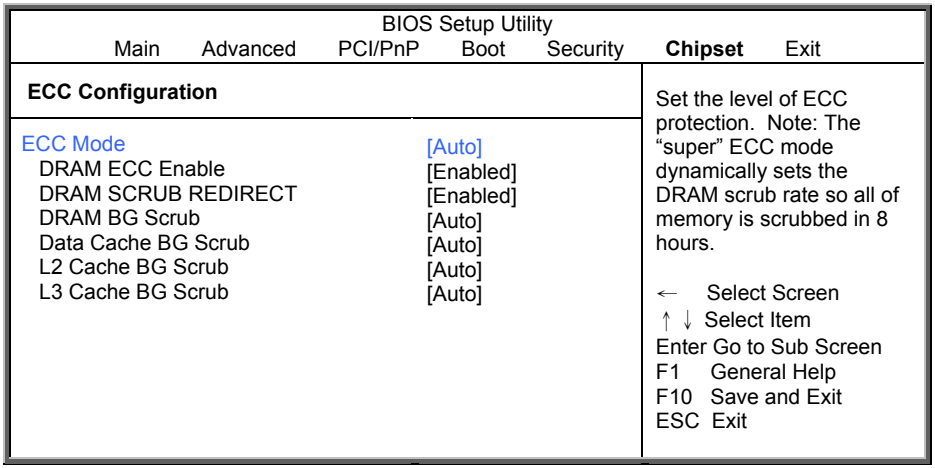
Node Interleaving
Enable Node Memory Interleaving.
Disabled / Enabled

Channel Interleaving
Enable Channel Memory Interleaving.
Auto / Disabled

CS Sparing Enable
Reserve a spare memory rank in each node.
Disabled / Enabled

Bank Swizzle Mode
Enable or disable bank swizzle mode.
Enabled / Disabled

3.7.1.2 ECC Configuration


BIOS Setup Utility
Main Advanced PCI/PnP Boot Security Chipset Exit
ECC Configuration
ECC Mode [Auto]
DRAM ECC Enable [Enabled]
DRAM SCRUB REDIRECT [Enabled]
DRAM BG Scrub [Auto]
Data Cache BG Scrub [Auto]
L2 Cache BG Scrub [Auto]
L3 Cache BG Scrub [Auto]
Set the level of ECC protection. Note: The "super" ECC mode dynamically sets the DRAM scrub rate so all of memory is scrubbed in 8 hours.
← Select Screen
↑ ↓ Select Item
Enter Go to Sub Screen
F1 General Help
F10 Save and Exit
ESC Exit

ECC Mode
Select the level of ECC protection. Note: The "Super" ECC mode dynamically sets the DRAM scrub rate so all of memory is scrubbed in 8 hours.
Good / Super / Disabled / **Auto** / Max / User

DRAM ECC Enable
DRAM ECC allows hardware to report and correct memory errors automatically maintaining system integrity.
Enabled / Disabled

DRAM SCRUB REDIRECT
DRAM SCRUB REDIRECT allows the system to correct DRAM ECC errors immediately when they occur, even if background scrubbing is on.
Enabled / Disabled

DRAM BG Scrub
DRAM scrubbing corrects memory errors so later reads are correct. Doing this while memory is not being used improves performance.
Note: When AMD's node interleave feature is enabled, BIOS will force DRAM scrub off.
Disabled / 40ns / 80ns / 160ns / 320ns / 640ns / 1.28us / 2.56us / 5.12us / 10.2us / 20.5us / 41.0us / 81.9us / 163.8us / 327.7us / 655.4us / 1.31ms / 2.62ms / 5.24ms / 10.49ms / 20.97ms / 42.00ms / 84.00ms / **Auto**

Data Cache BG Scrub
Allow the L1 Data Cache RAM to be corrected while idle.

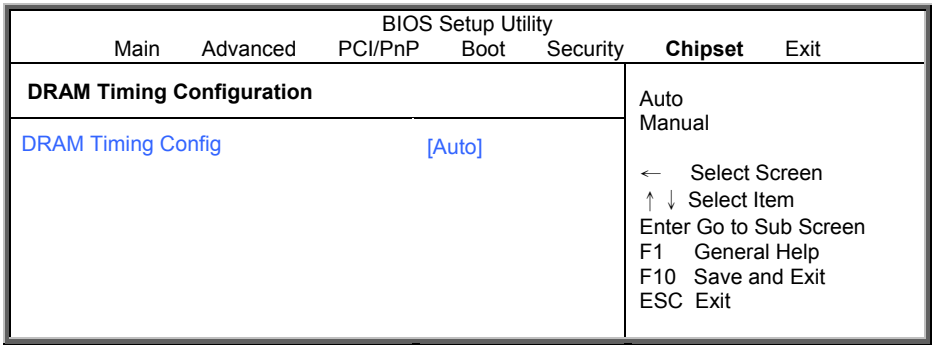
Auto / 40ns / 80ns / 160ns / 320ns / 640ns / 1.28us / 2.56us / 5.12us / 10.2us/ 20.5us / 41.0us / 82.9us / 163.8us / 327.7us / 655.4us / Disabled

L2/L3 Cache BG Scrub

Allow the L2/L3 Data Cache RAM to be corrected while idle.

Auto / 40ns / 80ns / 160ns / 320ns / 640ns / 1.28us / 2.56us / 5.12us / 10.2us/ 20.5us / 41.0us / 82.9us / 163.8us / 327.7us / 655.4us / Disabled

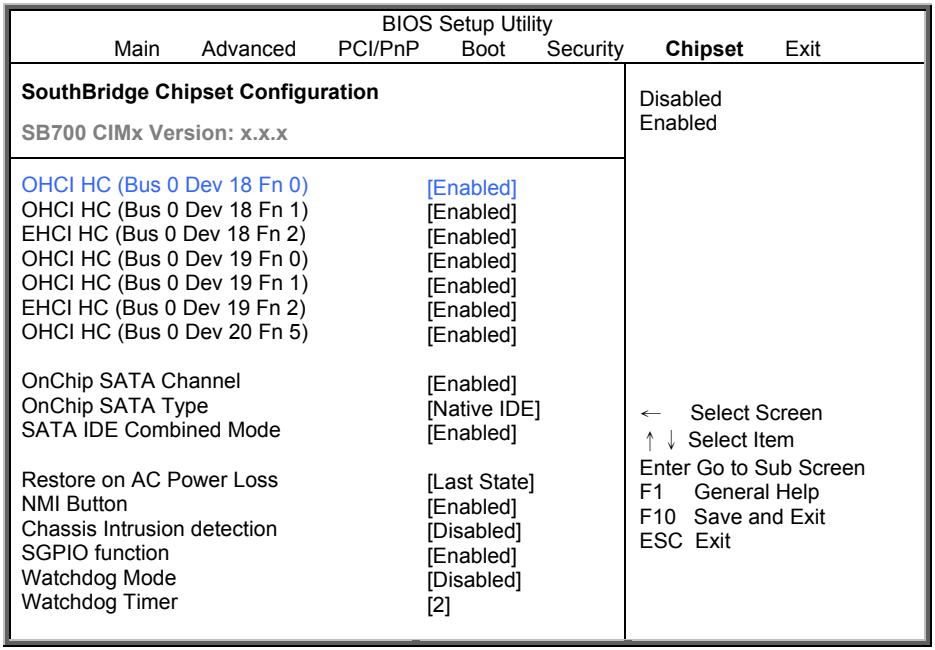
3.7.1.3 DRAM Timing Configuration



DRAM Timing Config
Select the DRAM Frequency programming method. If Auto, the DRAM speed will be based on SPDs. If Manual, the DRAM speed specified will be programmed by users.

Auto / Manual

3.7.2 South Bridge Configuration


BIOS Setup Utility
Main Advanced PCI/PnP Boot Security Chipset Exit
SouthBridge Chipset Configuration
SB700 CIMx Version: x.x.x
OHCI HC (Bus 0 Dev 18 Fn 0) [Enabled]
OHCI HC (Bus 0 Dev 18 Fn 1) [Enabled]
EHCI HC (Bus 0 Dev 18 Fn 2) [Enabled]
OHCI HC (Bus 0 Dev 19 Fn 0) [Enabled]
OHCI HC (Bus 0 Dev 19 Fn 1) [Enabled]
EHCI HC (Bus 0 Dev 19 Fn 2) [Enabled]
OHCI HC (Bus 0 Dev 20 Fn 5) [Enabled]
OnChip SATA Channel [Enabled]
OnChip SATA Type [Native IDE]
SATA IDE Combined Mode [Enabled]
Restore on AC Power Loss [Last State]
NMI Button [Enabled]
Chassis Intrusion detection [Disabled]
SGPIO function [Enabled]
Watchdog Mode [Disabled]
Watchdog Timer [2]
Disabled
Enabled
← Select Screen
↑ ↓ Select Item
Enter Go to Sub Screen
F1 General Help
F10 Save and Exit
ESC Exit

OHCI HC/EHCI HC

Enabled / Disabled

OnChip SATA Channel

Enable or disable OnChip SATA channel.

Enabled / Disabled

OnChip SATA Type

Select OnChip SATA type.

Native IDE / RAID / AHCI / Legacy IDE

SATA IDE Combined Mode

Enable or disable the SATA IDE Combined Mode.

Disabled / **Enabled**

Restore On AC Power Loss

Configure how the system board responds to a power failure.

Power Off / Power On / Last State

NMI Button
Enable or disable the NMI button on the front panel.
Enabled / Disabled

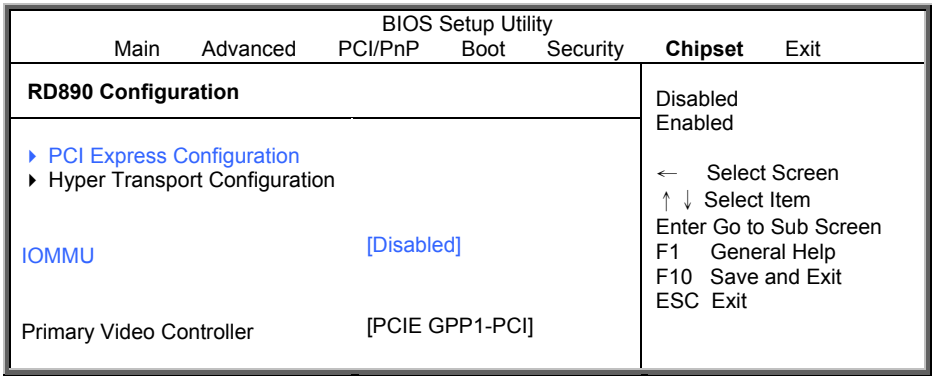
Chassis Intrusion Detection
Disabled: Disable Chassis Intrusion Detection.
Enabled: When a chassis open event is detected, the BIOS will report the event.
Disabled / Enabled

SGPIO Function
Enable or disable the SP5100 SGPIO function.
Enabled / Disabled

Watchdog Mode
POST: Watchdog timer counting, start at Power on, stop at OS Boot
OS: Start at OS Boot
Power on: Start at power on
Disabled / POST / OS / Power On

Watchdog Timer
Watchdog timer sets 2/4/6/8/10/12 minutes.
When WD time-out occurs, system will auto reboot.
2 / 4 / 6 / 8 / 10 / 12

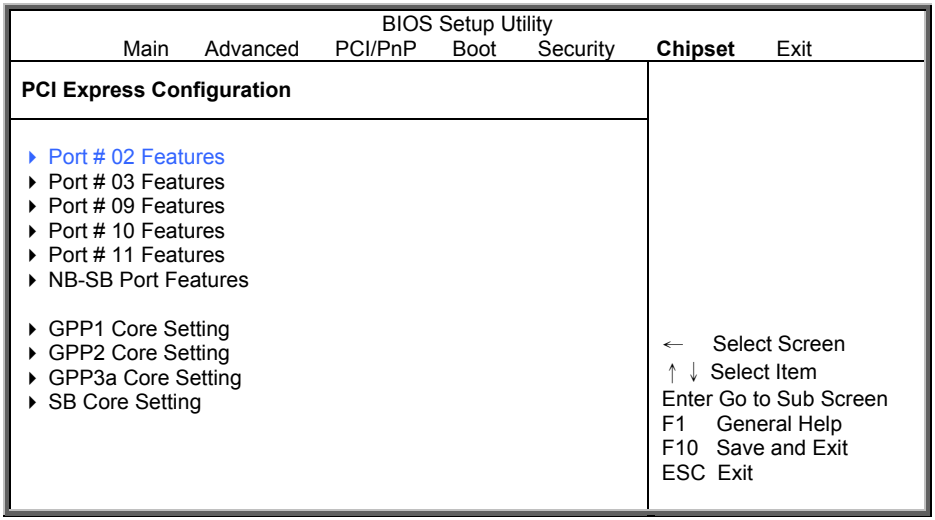
3.7.3 RD890 Configuration



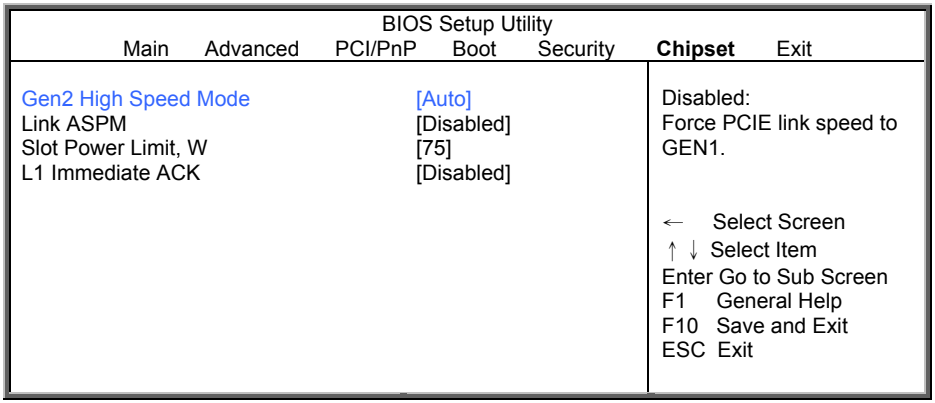
IOMMU
Disable or Enable IOMMU function.
Disabled / Enabled

Primary Video Controller
PCIE GPP1-PCI: Video card scan from PCIE bus, GPP1 to PCI bus.
PCI-PCIE GPP1: Video card scan from PCI bus, PCIE bus to GPP1.
PCIE GPP1-PCI / PCI-PCIE GPP1

3.7.3.1 PCI Express Configuration



3.7.3.1.1 Port # 02/03/11 Features



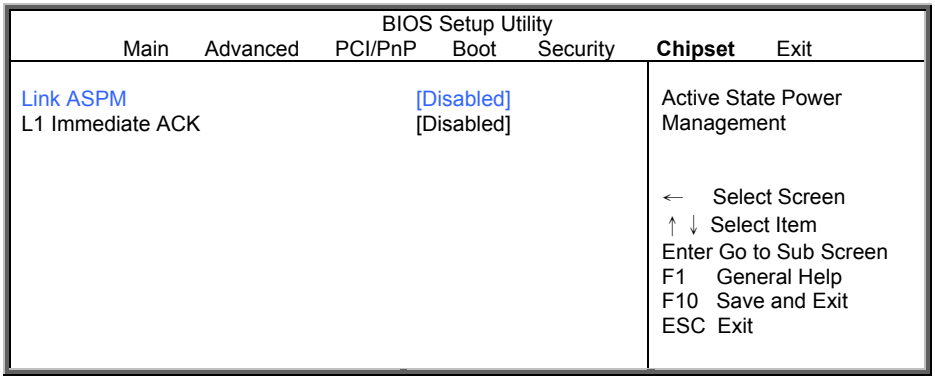
Gen2 High Speed Mode
Disabled: force PCIE link speed to GEN1.
Auto / Disabled

Link ASPM
Active State Power Management.
Disabled / L0s / L1 / L0s & L1 / L0s Downstream / L0s Downstream + L1

Slot Power Limit, W
Set Slot Power Limit.

L1 Immediate ACK
When Enabled L1 will be ACK'd immediately.
Disabled / Enabled

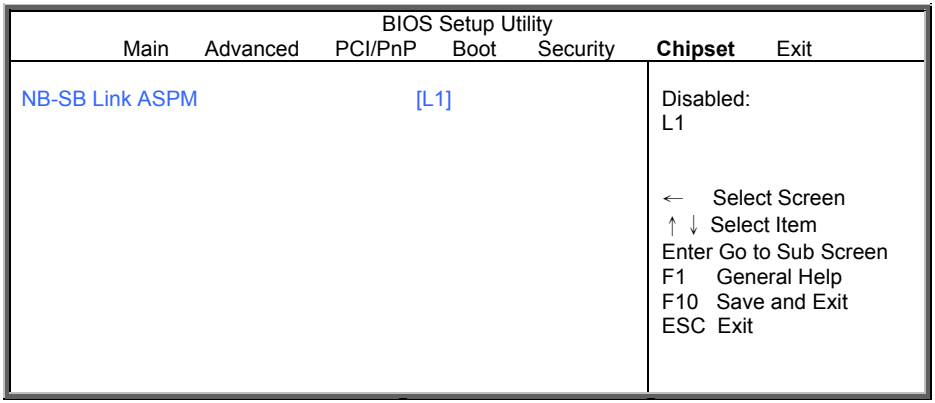
3.7.3.1.2 Port # 09/10 Features



Link ASPM
Active State Power Management.
Disabled / L0s / L1 / L0s & L1 / L0s Downstream / L0s Downstream + L1

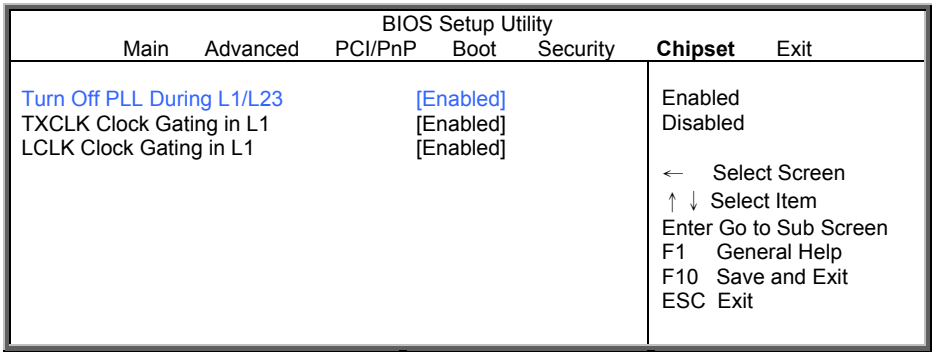
L1 Immediate ACK
When Enabled L1 will be ACK'd immediately.
Disabled / Enabled

3.7.3.1.3 NB-SB Port Features



NB-SB Link ASPM
Active State Power Management.
L1 / Disabled

3.7.3.1.3 GPP1/GPP2/GPP3a Core Setting

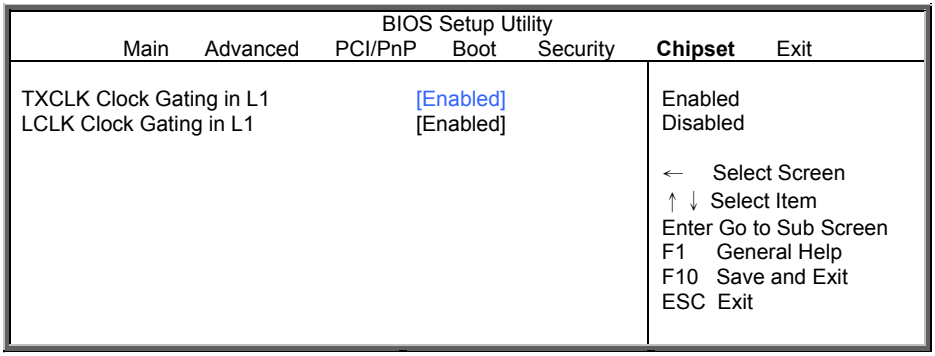


Turn Off PLL During L1/L23
Enabled / Disabled

TXCLK Clock Gating in L1
Enabled / Disabled

LCLK Clock Gating in L1
Enabled / Disabled

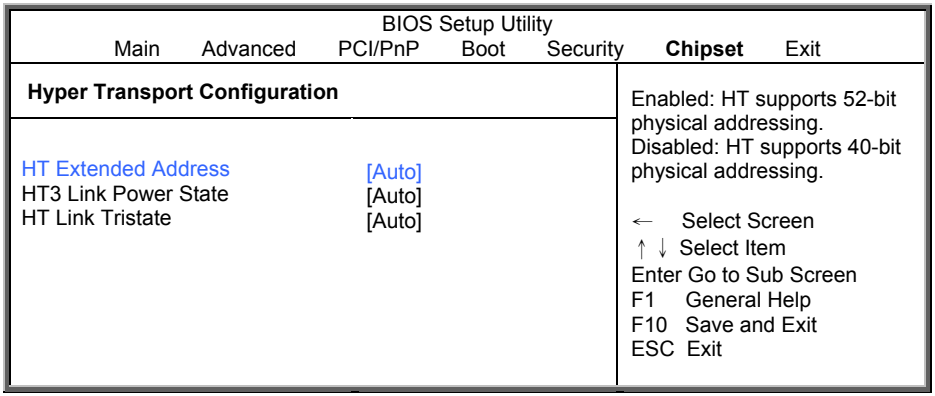
3.7.3.1.4 SB Core Setting



TXCLK Clock Gating in L1
Enabled / Disabled

LCLK Clock Gating in L1
Enabled / Disabled

3.7.3.2 Hyper Transport Configuration

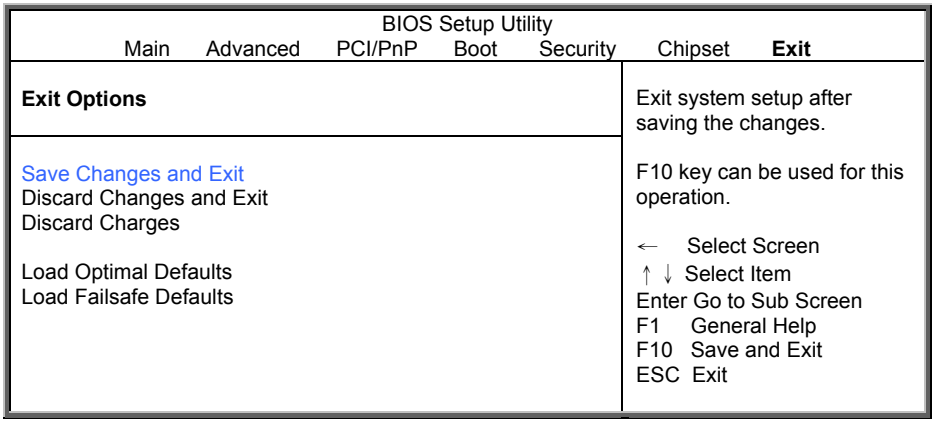

BIOS Setup Utility
Main Advanced PCI/PnP Boot Security Chipset Exit
Hyper Transport Configuration
HT Extended Address [Auto]
HT3 Link Power State [Auto]
HT Link Tristate [Auto]
Enabled: HT supports 52-bit physical addressing.
Disabled: HT supports 40-bit physical addressing.
← Select Screen
↑ ↓ Select Item
Enter Go to Sub Screen
F1 General Help
F10 Save and Exit
ESC Exit

HT Extended Address
Enabled: HT supports 52-bit physical addressing.
Disabled: HT supports 40-bit physical addressing.
Auto / Enabled / Disabled

HT3 Link Power State
Select the HT3 Link Power State.
Auto / LS0 / LS1 / LS2 / LS3

HT Link Tristate
Select the HT1 Link Tristate mode.
Auto / Disabled / CAD/CTL / CAD/CTL/CLK

3.8 Exit Menu


BIOS Setup Utility
Main Advanced PCI/PnP Boot Security Chipset Exit
Exit Options
Save Changes and Exit
Discard Changes and Exit
Discard Charges
Load Optimal Defaults
Load Failsafe Defaults
Exit system setup after saving the changes.
F10 key can be used for this operation.
← Select Screen
↑ ↓ Select Item
Enter Go to Sub Screen
F1 General Help
F10 Save and Exit
ESC Exit

Save Changes and Exit
Use this option to exit setup utility and re-boot.
All new selections you have made are stored into CMOS.
System will use the new settings to boot up.

Discard Changes and Exit
Use this option to exit setup utility and re-boot.
All new selections you have made are not stored into CMOS.
System will use the old settings to boot up.

Discard Changes
Use this option to restore all new setup values that you have made but not saved into CMOS.

Load Optimal Defaults
Use this option to load default performance setup values.
Use this option when system CMOS values have been corrupted or modified incorrectly.

Load Failsafe Defaults
Use this option to load all default failsafe setup values.
Use this option when troubleshooting.

NOTE

Chapter 4: Diagnostics

NOTE: if you experience problems with setting up your system, always check the following things in the following order:

Memory, Video, CPU

By checking these items, you will most likely find out what the problem might have been when setting up your system. For more information on troubleshooting, check the TYAN website at http://www.tyan.com.

4.1 Flash Utility

Every BIOS file is unique for the motherboard it was designed for. For Flash Utilities, BIOS downloads, and information on how to properly use the Flash Utility with your motherboard, please check the TYAN web site at http://www.tyan.com

NOTE: Please be aware that by flashing your BIOS, you agree that in the event of a BIOS flash failure, you must contact your dealer for a replacement BIOS. There are no exceptions. TYAN does not have a policy for replacing BIOS chips directly with end users. In no event will TYAN be held responsible for damages done by the end user.

4.2 AMIBIOS Post Code

The POST code checkpoints are the largest set of checkpoints during the BIOS pre-boot process. The following table describes the type of checkpoints that may occur during the POST portion of the BIOS:

Checkpoint	Description
03	Disable NMI, Parity, video for EGA, and DMA controllers. Initialize BIOS, POST, Runtime data area. Also initialize BIOS modules on POST entry and GPNV area. Initialized CMOS as mentioned in the Kernel Variable "wCMOSFlags."
04	Check CMOS diagnostic byte to determine if battery power is OK and CMOS checksum is OK. Verify CMOS checksum manually by reading storage area. If the CMOS checksum is bad, update CMOS with power-on default values and clear passwords. Initialize status register A. Initializes data variables that are based on CMOS setup questions. Initializes both the 8259 compatible PICs in the system
05	Initializes the interrupt controlling hardware (generally PIC) and interrupt vector table.
06	Do R/W test to CH-2 count reg. Initialize CH-0 as system timer.Install the POSTINT1Ch handler. Enable IRQ-0 in PIC for system timer interrupt. Traps INT1Ch vector to "POSTINT1ChHandlerBlock."
08	Initializes the CPU. The BAT test is being done on KBC. Program the keyboard controller command byte is being done after Auto detection of KB/MS using AMI KB-5.
0A	Initializes the 8042 compatible Key Board Controller.
0B	Detects the presence of PS/2 mouse.
0C	Detects the presence of Keyboard in KBC port.
0E	Testing and initialization of different Input Devices. Also, update the Kernel Variables. Traps the INT09h vector, so that the POST INT09h handler gets control for IRQ1. Uncompress all available language, BIOS logo, and Silent logo modules.
13	Early POST initialization of chipset registers.
24	Uncompress and initialize any platform specific BIOS modules.
30	Initialize System Management Interrupt.
2A	Initializes different devices through DIM. See *DIM Code Checkpoints* section of document for more information.
2C	Initializes different devices. Detects and initializes the video adapter installed in the system that have optional ROMs.
2E	Initializes all the output devices.
31	Allocate memory for ADM module and uncompress it. Give control to ADM module for initialization. Initialize language and font modules for ADM. Activate ADM module.
33	Initializes the silent boot module. Set the window for displaying text information.
37	Displaying sign-on message, CPU information, setup key message, and any OEM specific information.

Checkpoint	Description
38	Initializes different devices through DIM. See *DIM Code Checkpoints* section of document for more information.
39	Initializes DMAC-1 & DMAC-2.
3A	Initialize RTC date/time.
3B	Test for total memory installed in the system. Also, Check for DEL or ESC keys to limit memory test. Display total memory in the system.
3C	Mid POST initialization of chipset registers.
40	Detect different devices (Parallel ports, serial ports, and coprocessor in CPU, … etc.) successfully installed in the system and update the BDA, EBDA…etc.
50	Programming the memory hole or any kind of implementation that needs an adjustment in system RAM size if needed.
52	Updates CMOS memory size from memory found in memory test. Allocates memory for Extended BIOS Data Area from base memory.
60	Initializes NUM-LOCK status and programs the KBD typematic rate.
75	Initialize Int-13 and prepare for IPL detection.
78	Initializes IPL devices controlled by BIOS and option ROMs.
7A	Initializes remaining option ROMs.
7C	Generate and write contents of ESCD in NVRam.
84	Log errors encountered during POST.
85	Display errors to the user and gets the user response for error.
87	Execute BIOS setup if needed / requested.
8C	Late POST initialization of chipset registers.
8E	Program the peripheral parameters. Enable/Disable NMI as selected
90	Late POST initialization of system management interrupt.
A0	Check boot password if installed.
A1	Clean-up work needed before booting to OS.
A2	Takes care of runtime image preparation for different BIOS modules. Fill the free area in F000h segment with 0FFh. Initializes the Microsoft IRQ Routing Table. Prepares the runtime language module. Disables the system configuration display if needed.
A4	Initialize runtime language module.
A7	Displays the system configuration screen if enabled. Initialize the CPU's before boot, which includes the programming of the MTRR's.
A8	Prepare CPU for OS boot including final MTRR values.
A9	Wait for user input at config display if needed.
AA	Uninstall POST INT1Ch vector and INT09h vector. Deinitializes the ADM module.
AB	Prepare BBS for Int 19 boot.
AC	End of POST initialization of chipset registers.
B1	Save system context for ACPI.
00	Passes control to OS Loader (typically INT19h).

NOTE

Glossary

ACPI (Advanced Configuration and Power Interface): a power management specification that allows the operating system to control the amount of power distributed to the computer's devices. Devices not in use can be turned off, reducing unnecessary power expenditure.

AGP (Accelerated Graphics Port): a PCI-based interface which was designed specifically for demands of 3D graphics applications. The 32-bit AGP channel directly links the graphics controller to the main memory. While the channel runs only at 66 MHz, it supports data transmission during both the rising and falling ends of the clock cycle, yielding an effective speed of 133 MHz.

ATAPI (AT Attachment Packet Interface): also known as IDE or ATA; a drive implementation that includes the disk controller on the device itself. It allows CD-ROMs and tape drives to be configured as master or slave devices, just like HDDs.

ATX: the form factor designed to replace the AT form factor. It improves on the AT design by rotating the board 90 degrees, so that the IDE connectors are closer to the drive bays, and the CPU is closer to the power supply and cooling fan. The keyboard, mouse, USB, serial, and parallel ports are built-in.

Bandwidth: refers to carrying capacity. The greater the bandwidth, the more data the bus, phone line, or other electrical path can carry. Greater bandwidth results in greater speed.

BBS (BIOS Boot Specification): a feature within the BIOS that creates, prioritizes, and maintains a list of all Initial Program Load (IPL) devices, and then stores that list in NVRAM. IPL devices have the ability to load and execute an OS, as well as provide the ability to return to the BIOS if the OS load process fails. At that point, the next IPL device is called upon to attempt loading of the OS.

BIOS (Basic Input/Output System): the program that resides in the ROM chip, which provides the basic instructions for controlling your computer's hardware. Both the operating system and application software use BIOS routines to ensure compatibility.

Buffer: a portion of RAM which is used to temporarily store data; usually from an application though it is also used when printing and in most keyboard drivers. The CPU can manipulate data in a buffer before copying it to a disk drive. While this improves system performance (reading to or writing from a disk drive a single time is much faster than doing so repeatedly) there is the possibility of losing your data should the system crash. Information in a buffer is temporarily stored, not permanently saved.

Bus: a data pathway. The term is used especially to refer to the connection between the processor and system memory, and between the processor and PCI or ISA local buses.

Bus mastering: allows peripheral devices and IDEs to access the system memory without going through the CPU (similar to DMA channels).

Cache: a temporary storage area for data that will be needed often by an application. Using a cache lowers data access times since the information is stored in SRAM instead of slower DRAM. Note that the cache is also much smaller than your regular memory: a typical cache size is 512KB, while you may have as much as 4GB of regular memory.

Closed and open jumpers: jumpers and jumper pins are active when they are “on” or “closed”, and inactive when they are “off” or “open”.

CMOS (Complementary Metal-Oxide Semiconductors): chips that hold the basic startup information for the BIOS.

COM port: another name for the serial port, which is called as such because it transmits the eight bits of a byte of data along one wire, and receives data on another single wire (that is, the data is transmitted in serial form, one bit after another). Parallel ports transmit the bits of a byte on eight different wires at the same time (that is, in parallel form, eight bits at the same time).

DDR (Double Data Rate): a technology designed to double the clock speed of the memory. It activates output on both the rising and falling edge of the system clock rather than on just the rising edge, potentially doubling output.

DIMM (Dual In-line Memory Module): faster and more capacious form of RAM than SIMMs, and do not need to be installed in pairs.

DIMM bank: sometimes called DIMM socket because the physical slot and the logical unit are the same. That is, one DIMM module fits into one DIMM socket, which is capable of acting as a memory bank.

DMA (Direct Memory Access): channels that are similar to IRQs. DMA channels allow hardware devices (like soundcards or keyboards) to access the main memory without involving the CPU. This frees up CPU resources for other tasks. As with IRQs, it is vital that you do not double up devices on a single line. Plug-n-Play devices will take care of this for you.

DRAM (Dynamic RAM): widely available, very affordable form of RAM which looses data if it is not recharged regularly (every few milliseconds). This refresh requirement makes DRAM three to ten times slower than non-recharged RAM such as SRAM.

ECC (Error Correction Code or Error Checking and Correcting): allows data to be checked for errors during run-time. Errors can subsequently be corrected at the same time that they're found.

EEPROM (Electrically Erasable Programmable ROM): also called Flash BIOS, it is a ROM chip which can, unlike normal ROM, be updated. This allows you to keep up with changes in the BIOS programs without having to buy a new chip. TYAN®'s BIOS updates can be found at http://**www.tyan.com**

ESCD (Extended System Configuration Data): a format for storing information about Plug-n-Play devices in the system BIOS. This information helps properly configure the system each time it boots.

Firmware: low-level software that controls the system hardware.

Form factor: an industry term for the size, shape, power supply type, and external connector type of the Personal Computer Board (PCB) or motherboard. The standard form factors are the AT and ATX.

Global timer: onboard hardware timer, such as the Real-Time Clock (RTC).

HDD: stands for Hard Disk Drive, a type of fixed drive.

H-SYNC: controls the horizontal synchronization/properties of the monitor.

HyperTransport™: a high speed, low latency, scalable point-to-point link for interconnecting ICs on boards. It can be significantly faster than a PCI bus for an equivalent number of pins. It provides the bandwidth and flexibility critical for today's networking and computing platforms while retaining the fundamental programming model of PCI.

IC (Integrated Circuit): the formal name for the computer chip.

IDE (Integrated Device/Drive Electronics): a simple, self-contained HDD interface. It can handle drives up to 8.4 GB in size. Almost all IDEs sold now are in fact Enhanced IDEs (EIDEs), with maximum capacity determined by the hardware controller.

IDE INT (IDE Interrupt): Hardware interrupt signal that goes to the IDE.

I/O (Input/Output): the connection between your computer and another piece of hardware (mouse, keyboard, etc.)

IRQ (Interrupt Request): an electronic request that runs from a hardware device to the CPU. The interrupt controller assigns priorities to incoming requests and delivers them to the CPU. It is important that there is only one device hooked up to each IRQ line; doubling up devices on IRQ lines can lock up your system. Plug-n-Play operating systems can take care of these details for you.

Latency: the amount of time that one part of a system spends waiting for another part to catch up. This occurs most commonly when the system sends data out to a peripheral device and has to wait for the peripheral to spread (peripherals tend to be slower than onboard system components).

NVRAM: ROM and EEPROM are both examples of Non-Volatile RAM, memory that holds its data without power. DRAM, in contrast, is volatile.

Parallel port: transmits the bits of a byte on eight different wires at the same time.

PCI (Peripheral Component Interconnect): a 32 or 64-bit local bus (data pathway) which is faster than the ISA bus. Local buses are those which operate within a single system (as opposed to a network bus, which connects multiple systems).

PCI PIO (PCI Programmable Input/Output) modes: the data transfer modes used by IDE drives. These modes use the CPU for data transfer (in contrast, DMA channels do not). PCI refers to the type of bus used by these modes to communicate with the CPU.

PCI-to-PCI Bridge: allows you to connect multiple PCI devices onto one PCI slot.

Pipeline burst SRAM: a fast secondary cache. It is used as a secondary cache because SRAM is slower than SDRAM, but usually larger. Data is cached first to the faster primary cache, and then, when the primary cache is full, to the slower secondary cache.

PnP (Plug-n-Play): a design standard that has become ascendant in the industry. Plug-n-Play devices require little set-up to use. Devices and operating systems that are not Plug-n-Play require you to reconfigure your system each time you add or change any part of your hardware.

PXE (Preboot Execution Environment): one of four components that together make up the Wired for Management 2.0 baseline specification. PXE was designed to define a standard set of preboot protocol services within a client with the goal of allowing networked-based booting to boot using industry standard protocols.

RAID (Redundant Array of Independent Disks): a way for the same data to be stored in different places on many hard drives. By using this method, the data is stored redundantly and multiple hard drives will appear as a single drive to the operating system. RAID level 0 is known as striping, where data is striped (or overlapped) across multiple hard drives, but offers no fault-tolerance. RAID level 1 is known as mirroring, which stores the data within at least two hard drives, but does not stripe. RAID level 1 also allows for faster access time and fault-tolerance, since either hard drive can be read at the same time. RAID level 0+1 is striping and mirroring, providing fault-tolerance, striping, and faster access all at the same time.

RAIDIOS: RAID I/O Steering (Intel)

RAM (Random Access Memory): technically refers to a type of memory where any byte can be accessed without touching the adjacent data and is often referred to the system's main memory. This memory is available to any program running on the computer.

ROM (Read-Only Memory): a storage chip which contains the BIOS; the basic instructions required to boot the computer and start up the operating system.

SDRAM (Synchronous Dynamic RAM): called as such because it can keep two sets of memory addresses open simultaneously. By transferring data alternately from one set of addresses and then the other, SDRAM cuts down on the delays associated with non-synchronous RAM, which must close one address bank before opening the next.

Serial port: called as such because it transmits the eight bits of a byte of data along one wire, and receives data on another single wire (that is, the data is transmitted in serial form, one bit after another).

SCSI Interrupt Steering Logic (SISL): Architecture that allows a RAID controller, such as AcceleRAID 150, 200 or 250, to implement RAID on a system board-embedded SCSI bus or a set of SCSI busses. SISL: SCSI Interrupt Steering Logic (LSI) (only on LSI SCSI boards)

Sleep/Suspend mode: in this mode, all devices except the CPU shut down.

SDRAM (Static RAM): unlike DRAM, this type of RAM does not need to be refreshed in order to prevent data loss. Thus, it is faster and more expensive.

SLI (Scalable Link Interface): NVIDIA SLI technology links two graphics cards together to provide scalability and increased performance. NVIDIA SLI takes advantage of the increased bandwidth of the PCI Express bus architecture, and features hardware and software innovations within NVIDIA GPUs (graphics processing units) and NVIDIA MCPs (media and communications processors). Depending on the application, NVIDIA SLI can deliver as much as two times the performance of a single GPU configuration.

Standby mode: in this mode, the video and hard drives shut down; all other devices continue to operate normally.

UltraDMA-33/66/100: a fast version of the old DMA channel. UltraDMA is also called UltraATA. Without a proper UltraDMA controller, your system cannot take advantage of higher data transfer rates of the new UltraDMA/UltraATA hard drives.

USB (Universal Serial Bus): a versatile port. This one port type can function as a serial, parallel, mouse, keyboard or joystick port. It is fast enough to support video transfer, and is capable of supporting up to 127 daisy-chained peripheral devices.

VGA (Video Graphics Array): the PC video display standard

V-SYNC: controls the vertical scanning properties of the monitor.

ZCR (Zero Channel RAID): PCI card that allows a RAID card to use the onboard SCSI chip, thus lowering cost of RAID solution

ZIF Socket (Zero Insertion Force socket): these sockets make it possible to insert CPUs without damaging the sensitive CPU pins. The CPU is lightly placed in an open ZIF socket, and a lever is pulled down. This shifts the processor over and down, guiding it into the board and locking it into place.

Technical Support

If a problem arises with your system, you should first turn to your dealer for direct support. Your system has most likely been configured or designed by them and they should have the best idea of what hardware and software your system contains. Hence, they should be of the most assistance for you. Furthermore, if you purchased your system from a dealer near you, take the system to them directly to have it serviced instead of attempting to do so yourself (which can have expensive consequences).

If these options are not available for you then TYAN® Computer Corporation can help. Besides designing innovative and quality products for over a decade, TYAN has continuously offered customers service beyond their expectations. TYAN®'s website (**www.tyan.com**) provides easy-to-access FAQ searches and online Trouble Ticket creation as well as Instant Chat capabilities with our Support Agents. TYAN® also provides easy-to-access resources such as in-depth Linux Online Support sections with downloadable Linux drivers and comprehensive compatibility reports for chassis, memory and much more. With all these convenient resources just a few keystrokes away, users can easily find the latest software and operating system components to keep their systems running as powerful and productive as possible. TYAN® also ranks high for its commitment to fast and friendly customer support through email. By offering plenty of options for users, TYAN® serves multiple market segments with the industry's most competitive services to support them.

"TYAN's tech support is some of the most impressive we've seen, with great response time and exceptional organization in general" - Anandtech.com

Help Resources:

1. See the beep codes section of this manual.
2. See the TYAN® website for FAQ's, bulletins, driver updates, and other information: **http://www.tyan.com**
3. Contact your dealer for help BEFORE calling TYAN®.
4. Check the TYAN® user group: **alt.comp.periphs.mainboard.TYAN**

Returning Merchandise for Service

During the warranty period, contact your distributor or system vendor FIRST for any product problems. This warranty only covers normal customer use and does not cover damages incurred during shipping or failure due to the alteration, misuse, abuse, or improper maintenance of products.

NOTE:
A receipt or copy of your invoice marked with the date of purchase is required before any warranty service can be rendered. You may obtain service by calling the manufacturer for a Return Merchandise Authorization (RMA) number. The RMA number Should be prominently displayed on the outside of the shipping carton and the package should be mailed prepaid. TYAN® will pay to have the board shipped back to you.

Notice for the USA
Compliance Information Statement (Declaration of Conformity Procedure) DoC
FCC Part 15: This device complies with part 15 of the FCC Rules

Operation is subject to the following conditions:

This device may not cause harmful interference, and this device must accept any interference received including interference that may cause undesired operation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try one or more of the following measures:
Reorient or relocate the receiving antenna.
Increase the separation between the equipment and the receiver.
Plug the equipment into an outlet on a circuit different from that of the receiver.
Consult the dealer on an experienced radio/television technician for help.

Notice for Canada
This apparatus complies with the Class B limits for radio interference as specified in the Canadian Department of Communications Radio Interference Regulations. (Cet appareil est conforme aux norms de Classe B d'interference radio tel que specifie par le Ministere Canadien des Communications dans les reglements d'ineteference radio.)

CAUTION: Lithium battery included with this board. Do not puncture, mutilate, or dispose of battery in fire. There is danger of an explosion if the battery is incorrectly replaced. Replace only with the same or equivalent type recommended by manufacturer. Dispose of used battery according to manufacturer instructions and in accordance with your local regulations.

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